LEAN SIX SIGMA GREEN BELT
DMAIC SIMULATED PROJECT
TOLLGATE PRESENTATION

ABSTRACT:

This Six Sigma Green Belt project aimed to reduce lead times in Prosim Insurance's claims process, which was causing customer dissatisfaction. Using Lean Six Sigma's DMAIC approach, key issues like manual handling and redundant steps were addressed. Improvements included automating document approvals and streamlining processes, resulting in faster lead times and better efficiency.

By: Bonginkosi Ndaba

AGENDA

- Define
- Measure
- Analyse
- Improve
- Control

Define

- Map the Customer Journey
- Translate VOC to CTQs
- Project Charter

CUSTOMER JOURNEY MAP

On Stage
(what the customer experiences)

Event	Involved in Accident	Report Incident	Wait for Courtesy Vehicle	Searching for Service Providers	Send Documents	Follow-Up Call for Claim Status	Follow-Up with Manager	Paperwork Processed Notification	Receive Payment
Timeline	Day 0	Day 0	Day 0	Day 1-2	Day 3	Day 10	Day 17	Day 22	Day 52

Off Stage
(our internal interaction with the process)

The customer journey map reveals significant inefficiencies, including delays, repetitive steps, poor communication, and mismanaged processes. These issues result in frustration, stress, and a loss of trust from customers, highlighting the need for improvements in the claims process.

CUSTOMER MOMENT MAP

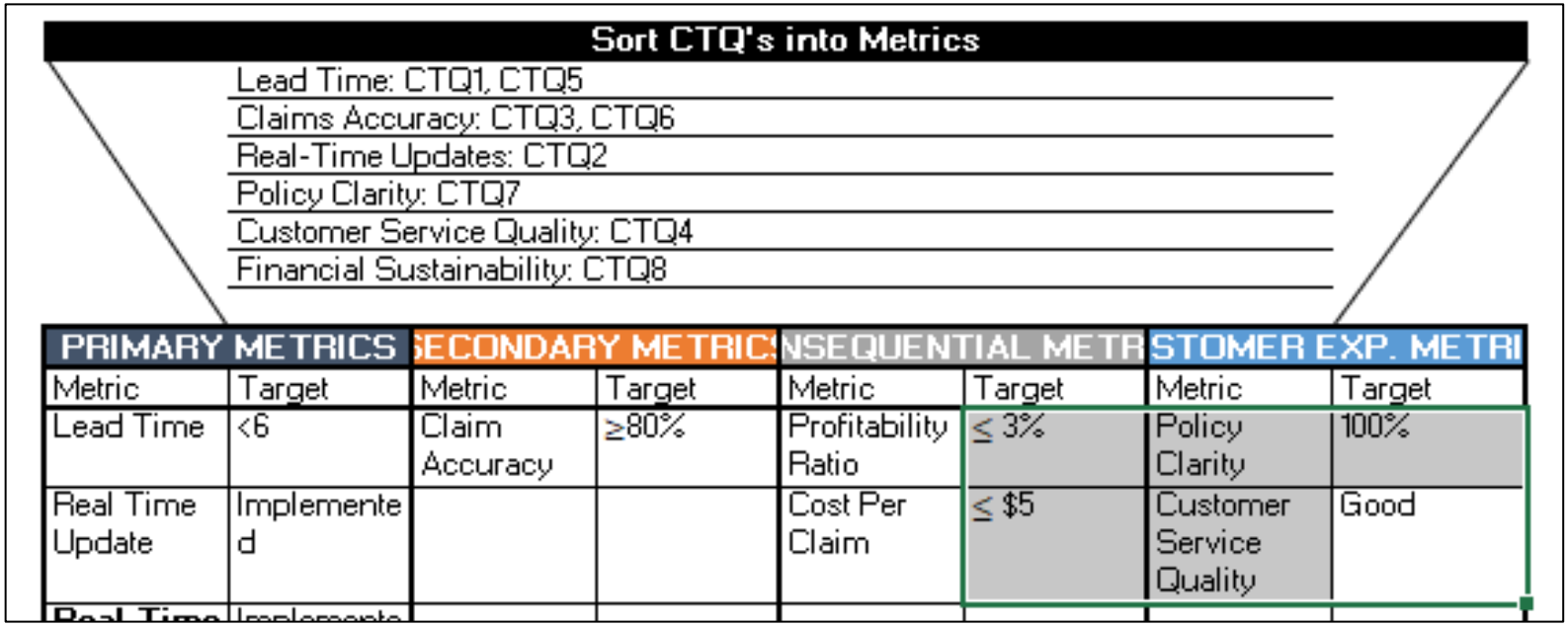
Step	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6	STEP 7	STEP 8	STEP 9
Description of Step	Involved in Accident	Report Incident	Wait for Courtesy Vehicle	Searching for Service Providers	Send Documents	Follow-Up Call for Claim Status	Second Follow-Up	Notification of Paperwork Receipt	Receive Payment
Customer Expectation	Immediate support and assurance from insurance	Efficient, quick claim initiation process	Timely support and logistics services	Assistance in managing post-accident necessities	Seamless document handling and processing	Regular updates and clear communication	Issue resolution and managerial intervention	Confirmation of process continuation	Accurate and timely financial settlement
Moments of Pain	Stress from incident	Repeating information multiple times	Delay in courtesy vehicle arrival	Burden of sourcing service providers	Documents lost, needing resubmission	Lack of updates, having to follow up	Needing managerial intervention without resolution	Delay in processing notification	Incorrect amount, delayed payment
Moments of Magic	Initial relief from having insurance		Quick vehicle arrangement		Prompt acknowledgment of documents	Timely and informative feedback	Direct manager involvement	Confirmation of process progression	Payment Recieved
Customer Emotions Evoked	Initial relief, followed by stress	Frustration, annoyance	Anxiety, inconvenience	Stress, exhaustion	Annoyance, fear of mismanagement	Frustration, helplessness	Anger, need for action	Disappointment, diminished trust	Exhaustion, disappointment
Recommended Actions	Enhance initial contact procedures to ensure faster support	Streamline information collection, integrate data systems	Implement a real-time tracking and faster dispatch system	Provide a network of approved service providers to speed up the process	Improve document management systems, ensure digital submissions	Establish proactive communication protocols, automated status updates	Train staff for higher accountability, empower immediate resolutions	Enhance internal tracking and customer notification systems	Audit and revise payment procedures to ensure accuracy and timeline

The customer moments map highlights key issues in the claims process, including repetitive information requests, delays in communication, lost documents, and an incorrect payment. These inefficiencies cause frustration, stress, and disappointment for customers, demonstrating the need for better management of touchpoints to enhance their overall experience.

VOC TO CTQ

	Voice of the Customer	VOC	Priority Rank	Critical to Quality (CTQ)
1	“How long is this going to take?”	Speed of processing claims	1	Average claims lead time ≤ 6 days
2	“I want the same speedy response that Prosim gets when I receive my bill.”	Timely and consistent communication	2	Real-time updates throughout the claims process
3	“I expect the correct payout with no sneaky surprises or hidden clauses.”	Accuracy and transparency in claims	1	Claims accuracy ≥ 80%
4	“Friendly and professional call center agents!”	Professionalism and quality of interaction	3	Customer service quality ≥ 90% satisfaction
5	“Give me my money now!”	Faster claim resolution	2	Timely payouts within 6 days
6	“I hate doing refunds because the service provider had a glitch.”	Error-free claims processing	3	Reduce rework by 50%
7	“What is my cover?”	Clarity and transparency in policy details	4	100% policy clarity for customers
8	“Preserve interest income.”	Maintain financial sustainability	4	Average cost per claim ≤ $5

The **VOC to CTQ Table** clearly converts customer feedback into measurable quality goals. Each VOC, like "How long is this going to take?" or "Preserve interest income," is prioritized and linked to specific CTQs. The inclusion of "Cost per Claim" under financial sustainability ensures both customer and operational needs are addressed.



PRIMARY METRICS		SECONDARY METRICS		NSEQUENTIAL METR		STOMER EXP. METRI	
Metric	Target	Metric	Target	Metric	Target	Metric	Target
Lead Time	<6	Claim Accuracy	≥80%	Profitability Ratio	≤ 3%	Policy Clarity	100%
Real Time Update	Implemented			Cost Per Claim	≤ $5	Customer Service Quality	Good

The **Sorted CTQs into Metrics** section organizes CTQs effectively:

1.Primary Metrics: Focus on key customer outcomes like lead time.

2.Secondary Metrics: Address process improvements such as Accuracy.

3.Consequential Metrics: Ensure financial and operational stability.

4.Customer Experience Metrics: Focus on service quality and satisfaction.

This grouping makes it easy to track progress and impact.

Business Case

The current claim processing system results in significant delays, inconsistent communication, and high customer dissatisfaction. Streamlining the process is important now to improve customer experience, reduce operational costs, and maintain competitiveness. Addressing these inefficiencies immediately will help maintain customer loyalty, prevent further losses, and ensure we remain competitive in the industry. This project aligns with the overall business strategy of enhancing customer service quality, operational efficiency, and reducing costs through effective process management.

Problem Statement

The existing claims process is slow, lacks transparency, and leads to customer dissatisfaction. Customers frequently experience long waiting times and inconsistent communication, leading to a decline in overall customer retention and a negative impact on brand reputation. The problem is observed across the Claims Department and Customer Service teams, and it has been ongoing for the past 12 months, affecting around 60% of claims. The current lead time is 12 days, which needs to be reduced.

Goal Statement

Reduce average claims lead time to 6 days, improve claims accuracy to 80%, and provide real-time updates to customers throughout the claims process while maintaining the financial feasibility of processing claims. This will lead to improved customer satisfaction and streamlined internal operations.

Project Scope

This project will cover the entire claim processing workflow, including data collection, communication with customers, and final payout. The project will exclude legal processes and policy underwriting activities.

Expected Benefits Hard Benefits

Description	Baseline Amount	Actual Amount	Comments / Reasons
Cost Reduction	$500,000 annually	$300,000 annually	Reduction in waste costs related to claim errors
Increased Revenue	$800,000 annually	$1,000,000 annually	Improved processing speed leads to more processed claims per year

The cost reduction specifically addresses unnecessary administrative costs and rework in the claims process, while increased revenue is tied to improved efficiency in processing claims.

Soft Benefits

Description	Baseline Amount	Actual Amount	Comments / Reasons
Customer Satisfaction	Current rating	+15%	Improved communication and faster service
Cost Avoidance	N/A	Avoided costs	Preventing costs related to manual errors and rework
Employee Retention	Moderate	Improved	Simplified processes reduce stress and improve retention

Project Resources

Proposed Team		**Other Resources**	
Name	**Role**	**Name**	**Role**
John Smith	Team Member: Client Support Service	IT Support Team	Technical Assistance
Jane Doe	Process Owner: Claims Specialist	Legal Advisor	Compliance Guidance
Mark Johnson	Team Member: Customer Service Lead	Call Center Agents	Provide Process Insights
Susan Clark	Financial SME: Financial Analyst		
Bongienkosi Ndaba	Green Belt: Process Improvement Lead		
Peter Adams	Champion: Project Sponsor		

DEFINE PROJECT REVIEW CHECKLIST

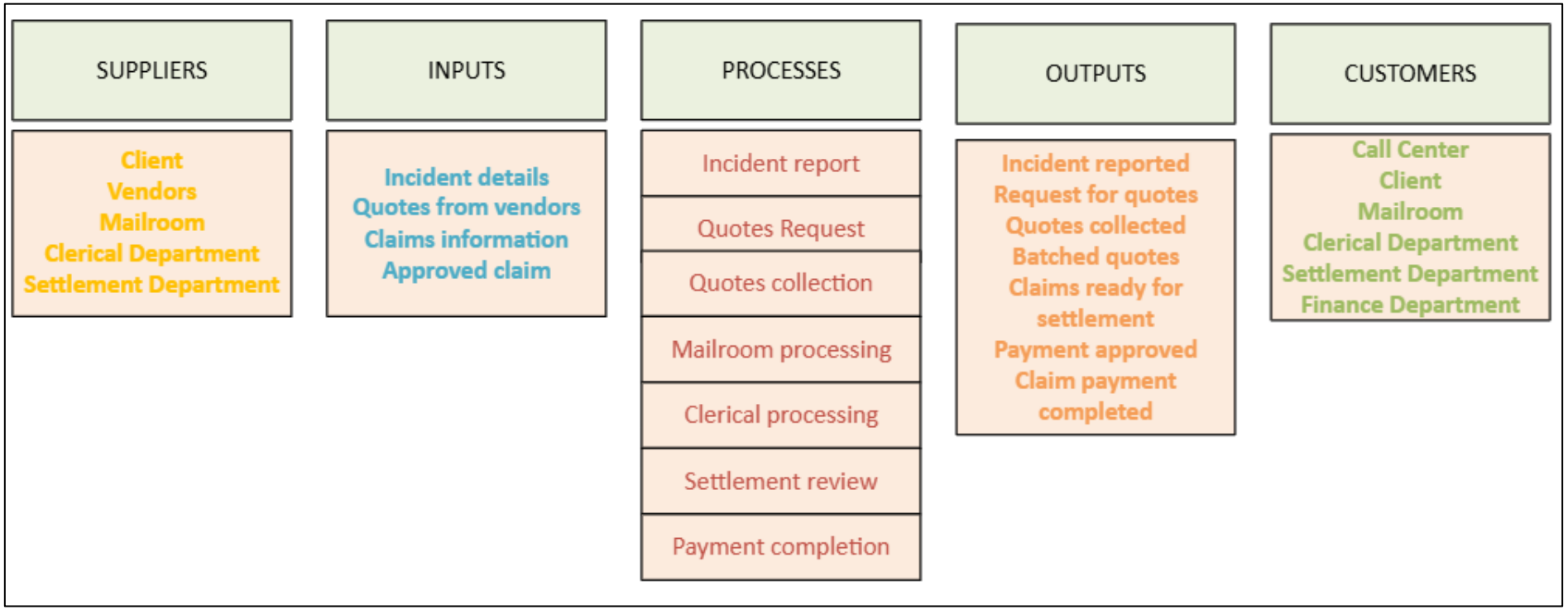
Complete Defining the Problem	Complete
Customer Experience evaluated?	**Yes** / No
CTQ's Identified?	**Yes** / No
Stakeholders Identified?	Yes / No
Communication Plan Completed?	Yes / No
Project Charter Developed?	**Yes** / No
Business Case Created?	**Yes** / No
Problem Statement Developed?	**Yes** / No
Goal Statement Completed?	**Yes** / No
Project Scope Identified?	**Yes** / No
Benefits Estimated?	**Yes** / No
Project Resources Assigned?	Yes / No

- Define
- Measure
- Analyse
- Improve
- Control

Measure

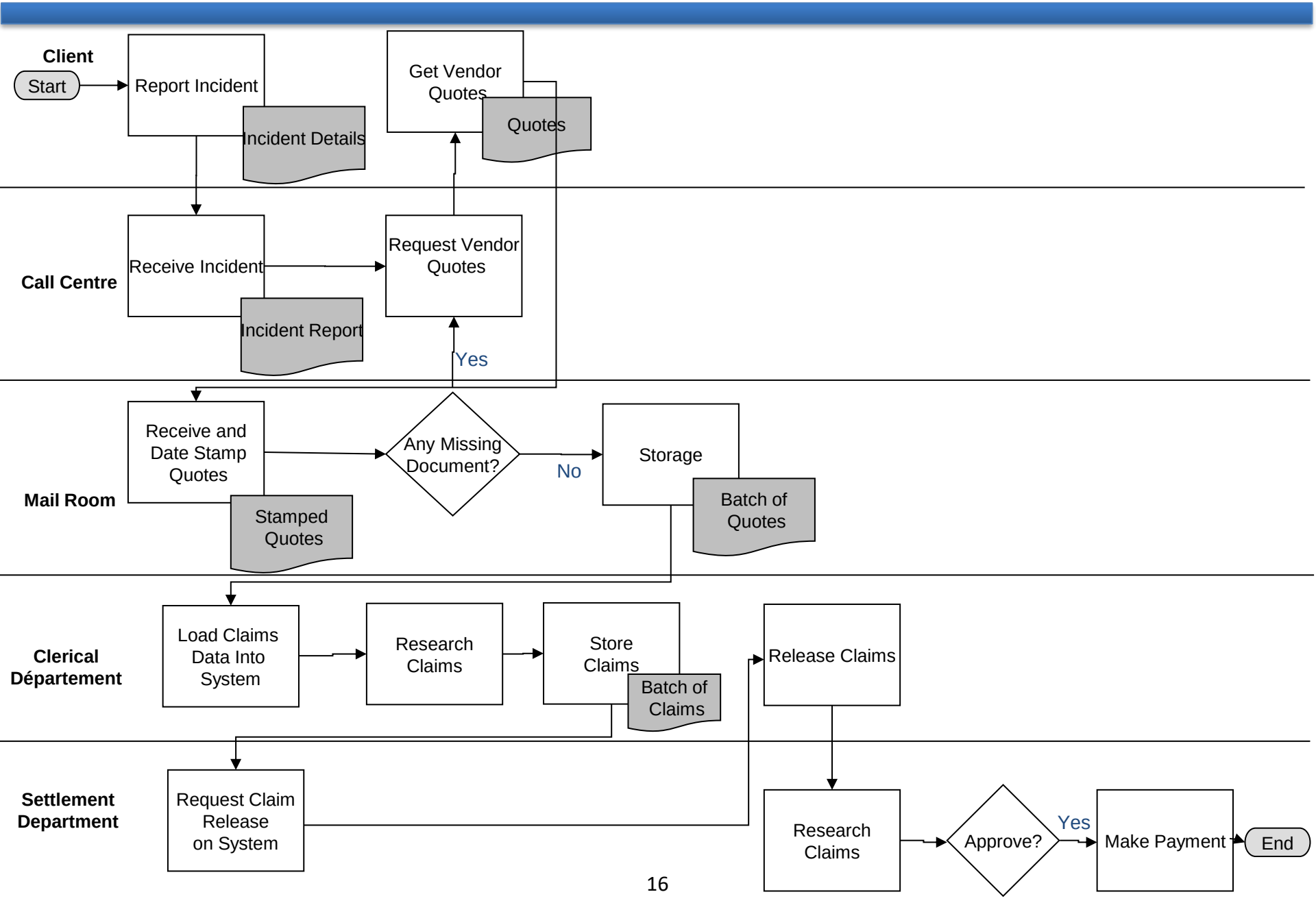
- Process Map
- Process Capability
- Identify & Screen Inputs
- Data Collection

AS IS PROCESS MAP-SIPOC



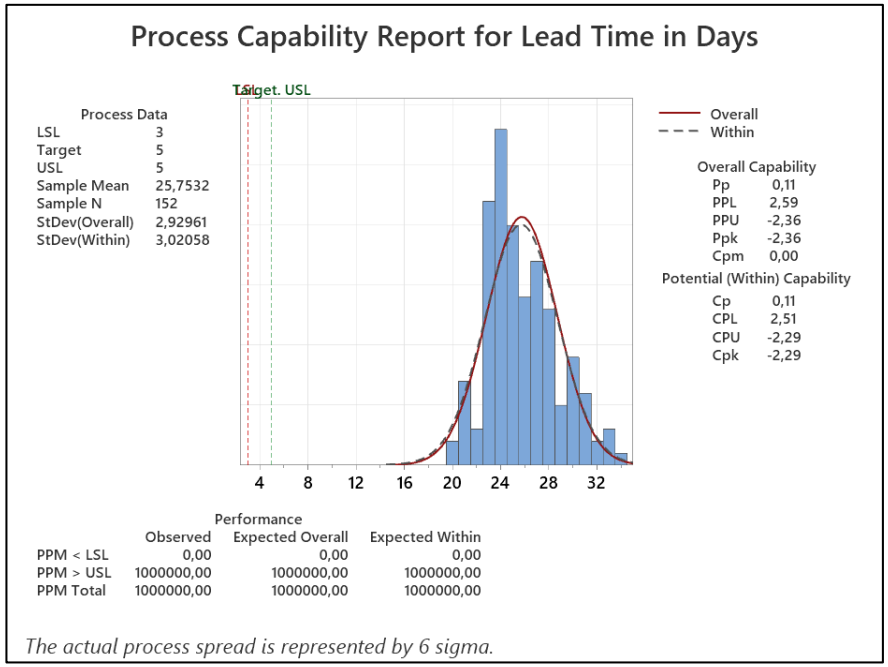
The SIPOC diagram provides a high-level view of the claims process, allowing us to understand how inputs are transformed into outputs across each major process stage. It highlights the relationships between suppliers, the internal processes, and the final outputs delivered to customers. This consolidated overview supports the identification of value-added steps and potential inefficiencies in the claims handling process.

AS IS PROCESS MAP-DETAILED



PROCESS CAPABILITY: PRIMARY METRIC

Unit	The item produced or processed – either a product or service transaction	Claims Process at Prosim Insurance	N = 152
Defect	Any event that does not meet the specification of a CTQ.	Claims that does not meet the specification of lead time (target of 5 days +- 1 day)	D = 152
Defect Opportunity	Any event which can be measured that provides a chance of not meeting a customer requirement	Each claim has one opportunity to meet the target lead time.	O = 1



Insights from the Capability Report

•**Process Mean**: The average lead time is **25.75 days**, far above the target of 5 days.

•**Standard Deviation**: The standard deviation is **2.93 days**, indicating high variability.

•**Capability Metrics**: Metrics like **PPU/Ppk (-2.25)** and **CPU/Cpk (-2.18)** reflect poor performance and inability to meet targets.

Observations

•The process lead time is significantly higher than the target of **5 days**.

•High variability indicates a lack of consistency in processing claims processing.

Next Steps

•Investigate causes of delays and variability in the process leading to mean of 25.75 days

Note: The capability analysis was conducted using Minitab.

PROCESS CAPABILITY: SECONDARY METRIC

Unit	The item produced or processed – either a product or service transaction	The number of claims received / month	N = 274136
Defect	Any event that does not meet the specification of a CTQ.	Number of Claims that were unresolved / month	D = 191895
Defect Opportunity	Any event which can be measured that provides a chance of not meeting a customer requirement	Number of opportunities for Prosim to get it right	O = 7

N=274136 D=191895 O=7

$$DPMO = \frac{D}{N\ X\ O} \text{ X } 1000000$$

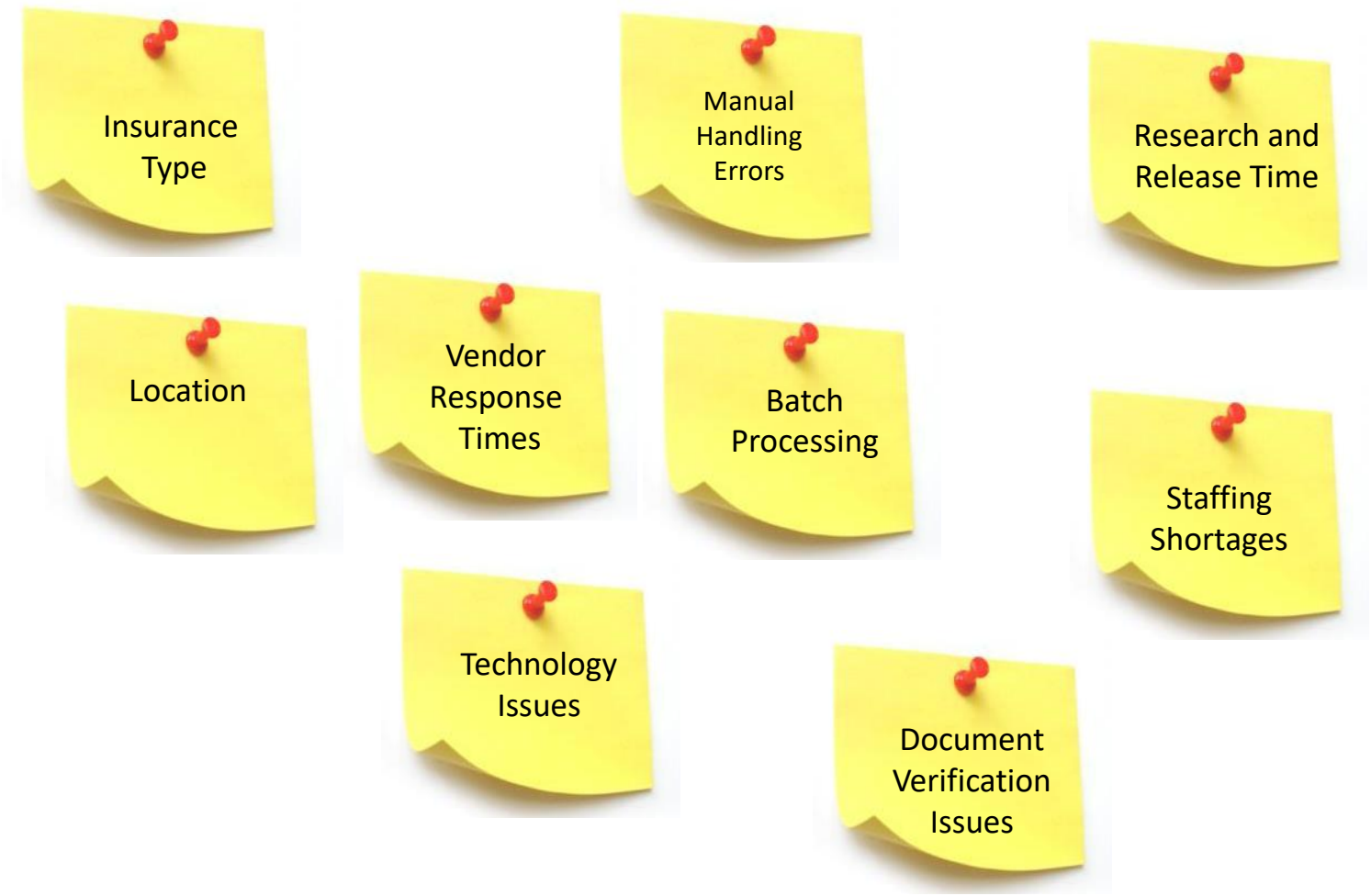
$$DPMO = \frac{191895}{274136\ X\ 7} \text{ X } 1000000$$

$$DPMO = 100000$$

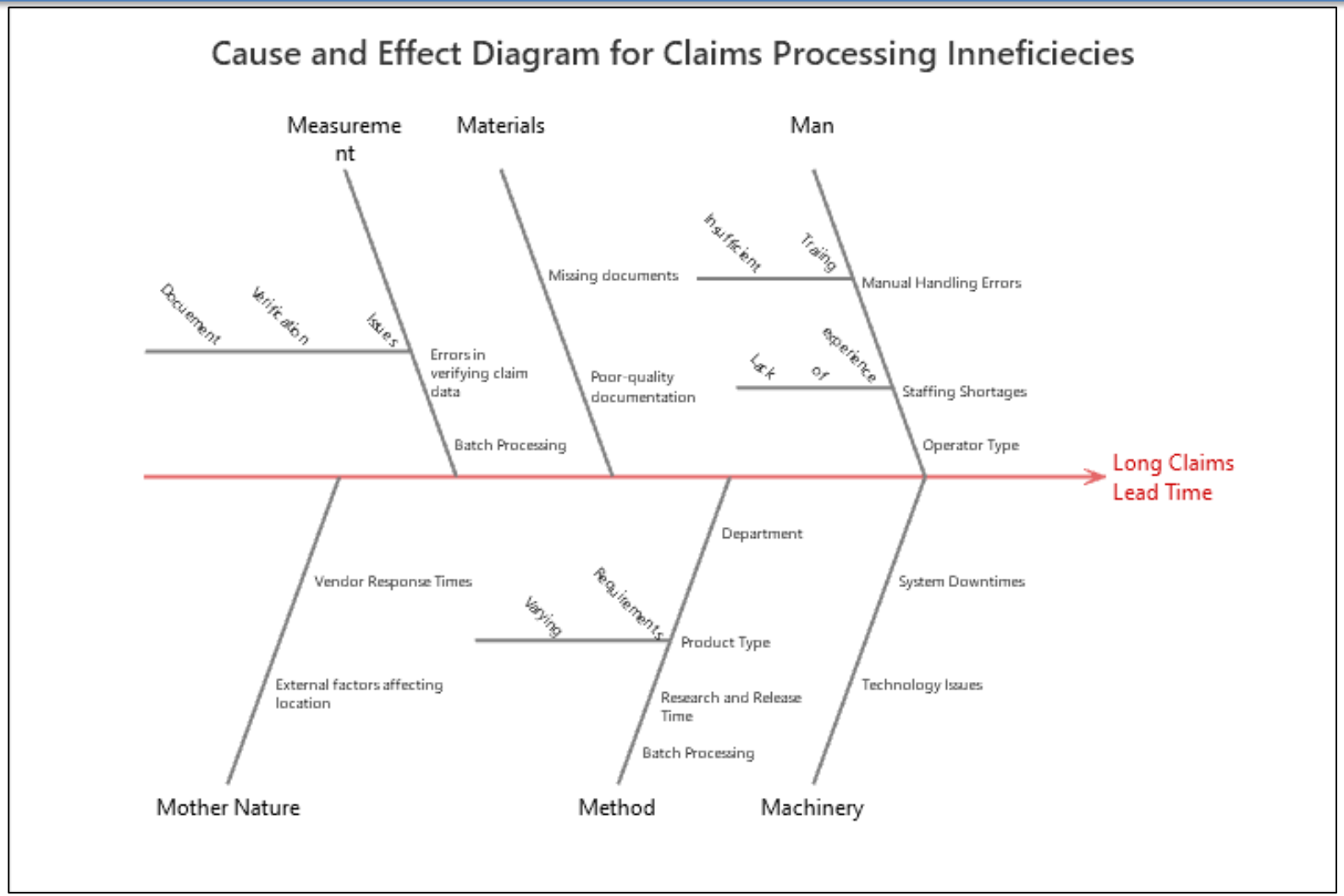
Sigma Level**= 1.5**

The calculated DPMO (Defects Per Million Opportunities) of 100,000 indicates a significant level of defects within the process, resulting in a sigma level of 1.5. This highlights a need for efforts on accuracy improvement, as the current defect rate suggests there are many opportunities where customer requirements are not being met effectively. Addressing these defect opportunities will help in increasing process capability.

IDENTIFY INPUTS - BRAINSTORMING



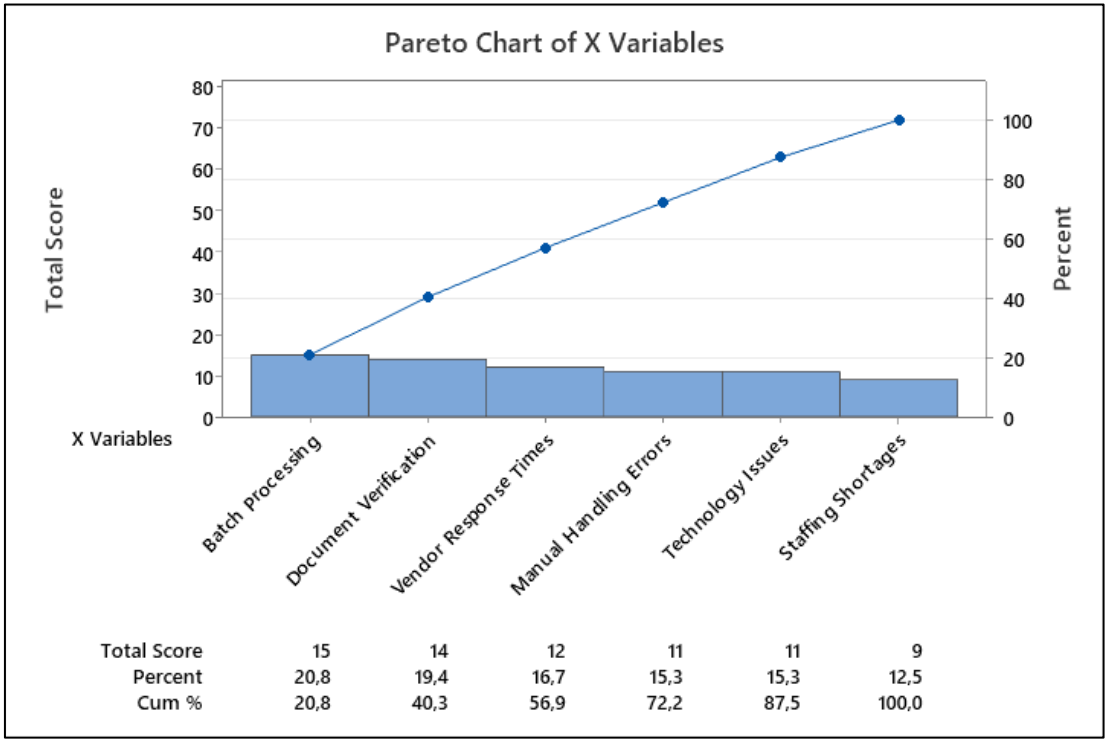
IDENTIFY INPUTS – CAUSE & EFFECT DIAGRAM



The Cause and Effect Diagram provides a visual representation of the primary factors contributing to long claims lead time. By categorizing root causes into key areas such as Man, Machinery, Method, and Materials, it helps us pinpoint areas of inefficiency, including the impact of batch processing, system downtimes, and operator variations. This structured approach will guide us in addressing the most critical drivers of delays

SCREENING INPUTS – XY MATRIX

X Variables	CTQ 1: Lead Time	CTQ 2: Accuracy	Total Score	Rank
Batch Processing	8	7	15	1
Vendor Response Times	8	4	12	3
Manual Handling Errors	5	6	11	4
Technology Issues	6	5	11	4
Staffing Shortages	4	5	9	5
Document Verification	6	8	14	2



- XY Prioritization Matrix and Pareto Chart identified key contributors to claims processing issues.
- Batch Processing, Document Verification, Vendor Response Times, and Manual Handling Errors are the top four contributors.
- These top four factors account for over 72% of the overall issues.
- Addressing these factors will significantly improve lead times and accuracy.

DATA COLLECTION PLAN

Measure	Type of Measure	Type of Data	Operational Definition	Sampling Frequency	Who by When
Batch Processing Time	Input	Continuous	Time taken from batch initiation to completion	Daily, Sample 20 claims each week	Process Owner - Next Month
Document Verification Errors	Output	Discrete	Number of errors in verified documents	Weekly, Sample 15 verified documents	QA Team - End of Month
Vendor Response Time	Input	Continuous	Time taken for vendors to respond to requests	Daily, Sample every vendor response	Procurement - Next Month
Manual Handling Errors	Output	Discrete	Number of manual errors in claims handling	Weekly, Sample 25 claims	Claims Team - End of Month

MEASURE PROJECT REVIEW CHECKLIST

Measure the Problem	Complete
Sigma Level Identified?	**Yes** / No
Measurement System Analysed?	**Yes** / No
Process Map Developed?	**Yes** / No
Inputs Identified	**Yes** / No
Inputs Screened for most likely causes?	**Yes** / No
Data Types Identified?	**Yes** / No
Data Collection Plan Completed?	**Yes** / No

Define

Measure

Analyse

Improve

Control

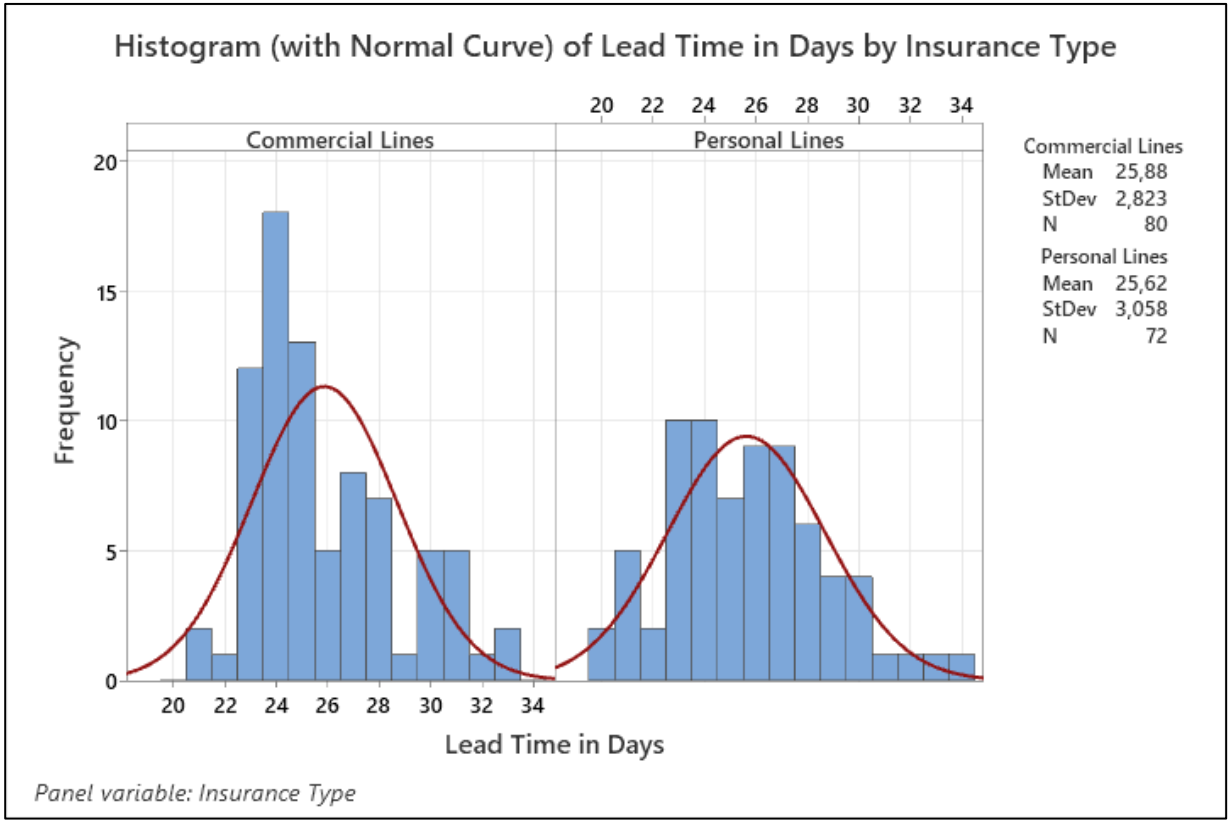
Analyse

- Analyse Phase Plan
- Display Data Graphically
- Analyse Data Statistically
- Process Analysis for Value

PLAN FOR ANALYSE

Likely Cause	Type of Input	Graphical Technique	Statistical Technique	Process Technique	Confirmed Root Causes
Location	Discrete	Boxplot	ANOVA	Hypothesis Testing	
Average Cost to Serve	Continuous	Scatterplot	Regression Analysis	Regression Analysis	
Department	Discrete	Boxplot	ANOVA	Hypothesis Testing	
Insurance Type	Discrete	Boxplot	2-Sample T Test	Hypothesis Testing	

ROOT CAUSE 1 - DISPLAY DATA

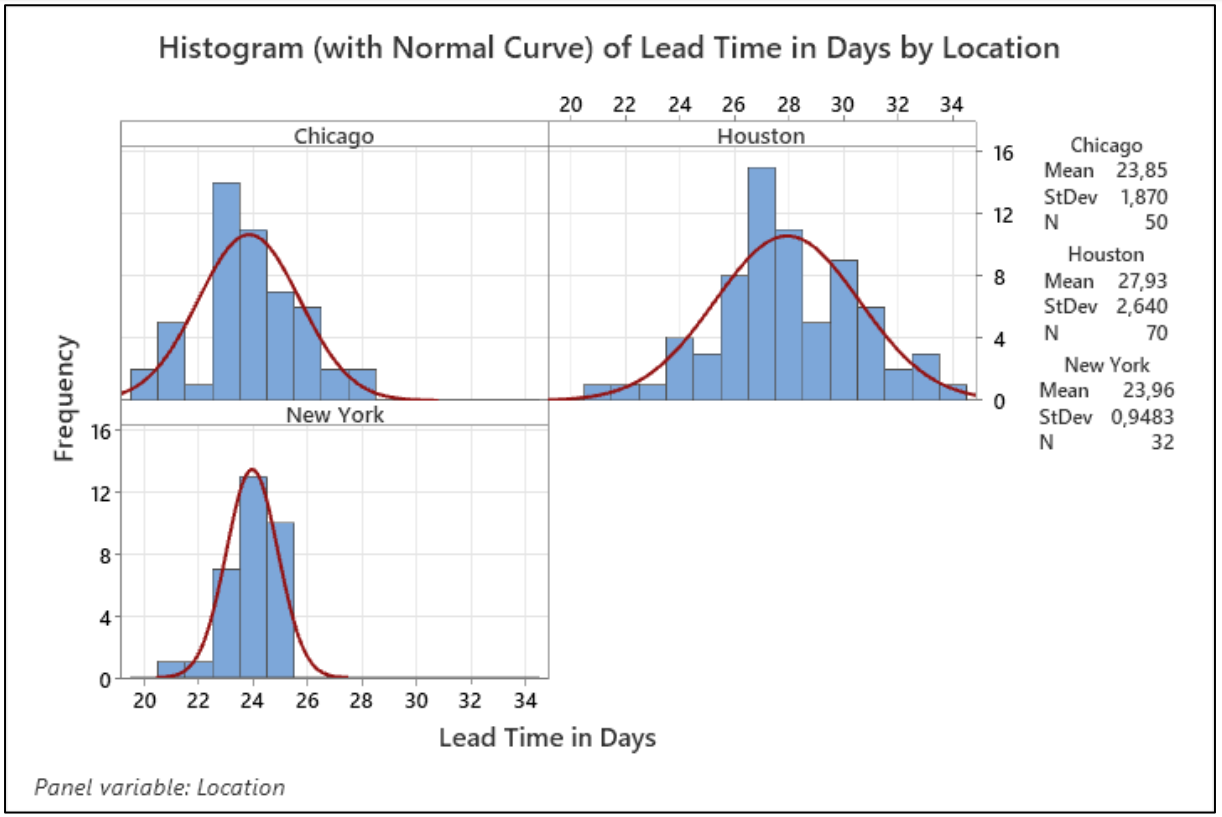


Statistics

Variable	Insurance Type	N	N*	Mean	SE Mean	StDev	Minimum	Q1	Median
Lead Time in Days	Commercial Lines	80	0	25,877	0,316	2,823	20,997	23,723	24,941
	Personal Lines	72	0	25,616	0,360	3,058	19,511	23,350	25,487

Variable	Insurance Type	Q3	Maximum
Lead Time in Days	Commercial Lines	27,757	32,659
	Personal Lines	27,575	34,352

ROOT CAUSE 2 - DISPLAY DATA

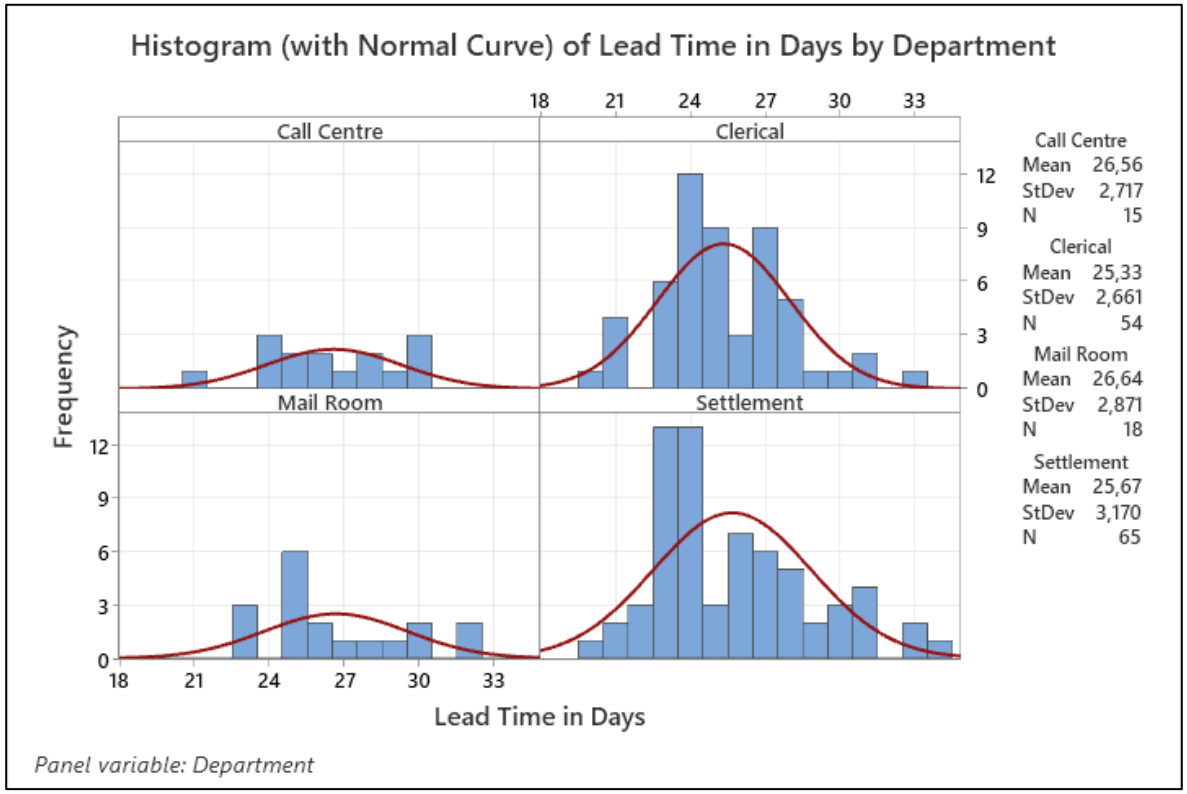


Statistics

Variable	Location	N	N*	Mean	SE Mean	StDev	Minimum	Q1	Median	Q3
Lead Time in Days	Chicago	50	0	23,850	0,264	1,870	19,511	22,777	23,854	25,160
	Houston	70	0	27,931	0,316	2,640	20,978	26,463	27,767	30,118
	New York	32	0	23,962	0,168	0,948	21,268	23,284	23,875	24,841

Variable	Location	Maximum
Lead Time in Days	Chicago	27,841
	Houston	34,352
	New York	25,454

ROOT CAUSE 3 - DISPLAY DATA



Statistics

Variable	Department	N	N*	Mean	SE Mean	StDev	Minimum	Q1	Median
Lead Time in Days	Call Centre	15	0	26,561	0,701	2,717	20,978	24,294	26,483
	Clerical	54	0	25,333	0,362	2,661	19,511	23,663	24,811
	Mail Room	18	0	26,641	0,677	2,871	22,801	24,825	25,727
	Settlement	65	0	25,670	0,393	3,170	20,421	23,219	24,965

Variable	Department	Q3	Maximum
Lead Time in Days	Call Centre	28,525	30,433
	Clerical	27,190	32,543
	Mail Room	29,335	32,212
	Settlement	27,606	34,352

ROOT CAUSE VALIDATION: INSURANCE TYPE

Method

μ_1: population mean of Lead Time in Days when Insurance Type = Commercial Lines
μ_2: population mean of Lead Time in Days when Insurance Type = Personal Lines
Difference: $\mu_1 - \mu_2$

Equal variances are not assumed for this analysis.

Descriptive Statistics: Lead Time in Days

Insurance Type	N	Mean	StDev	SE Mean
Commercial Lines	80	25,88	2,82	0,32
Personal Lines	72	25,62	3,06	0,36

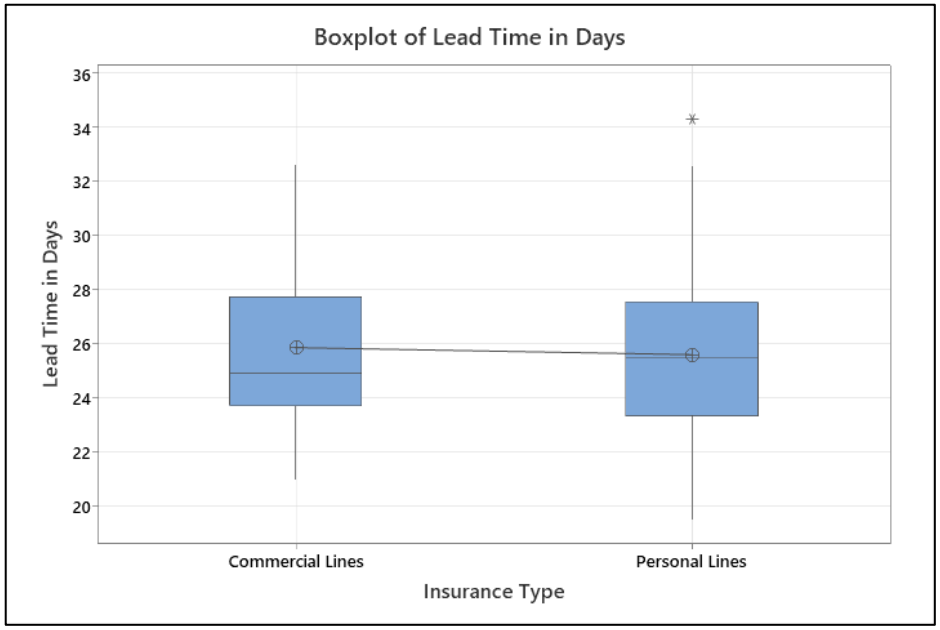
Estimation for Difference

Difference	95% CI for Difference
0,261	(-0,686. 1,207)

Test

Null hypothesis $H_0: \mu_1 - \mu_2 = 0$
Alternative hypothesis $H_1: \mu_1 - \mu_2 \neq 0$

T-Value	DF	P-Value
0,54	145	0,587



P-value = 0.578

Conclusion: Which a P-value greater than 0.05 at 95% confidence level, we cannot validate Insurance Type as root cause there is no statistical evidence that insurance type significantly impacts lead time

ROOT CAUSE 2 - STATISTICAL ANALYSIS

ROOT CAUSE VALIDATION: LOCATION

Method

Null hypothesis	All means are equal
Alternative hypothesis	Not all means are equal
Significance level	α = 0,05

Equal variances were assumed for the analysis.

Factor Information

Factor	Levels	Values
Location	3	Chicago. Houston. New York

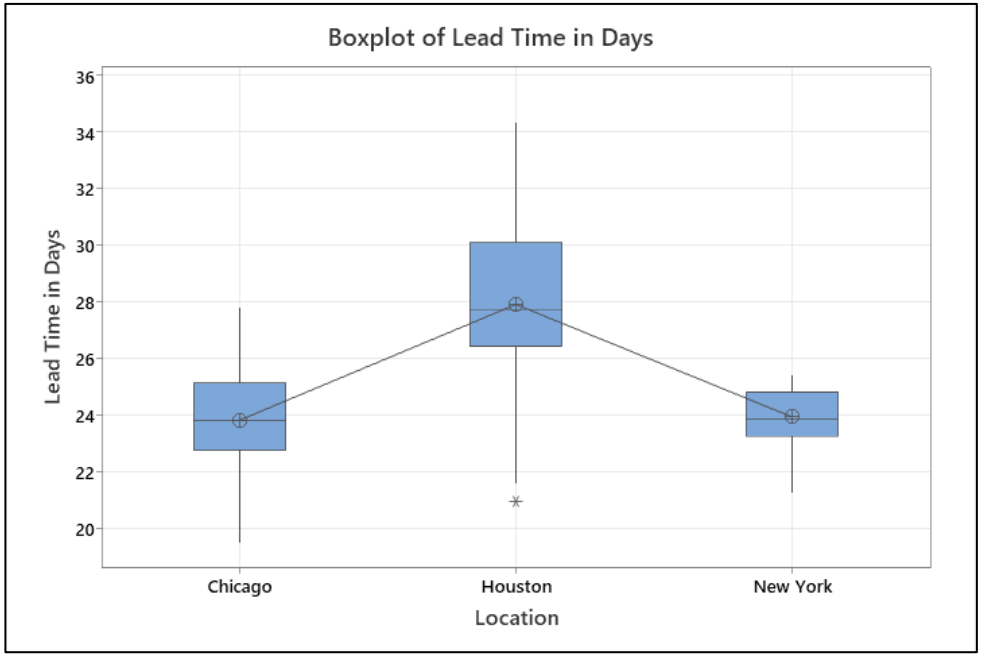
Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Location	2	615,9	307,950	67,47	0,000
Error	149	680,1	4,564		
Total	151	1296,0			

Means

Location	N	Mean	StDev	95% CI
Chicago	50	23,850	1,870	(23,253. 24,447)
Houston	70	27,931	2,640	(27,427. 28,436)
New York	32	23,962	0,948	(23,216. 24,709)

Pooled StDev = 2,13641



P-value = 0.000

Conclusion: Which a P-value Less than 0.05 at 95% confidence level, we can validate Location as a root cause because there is statistical evidence that Location significantly impacts lead time. With Houston Exhibiting more Lead Time Compared Chicago and New York.

Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
2,13641	47,52%	46,82%	45,75%

ROOT CAUSE 3 - STATISTICAL ANALYSIS

ROOT CAUSE VALIDATION: DEPARTMENT

Method

Null hypothesis	All means are equal
Alternative hypothesis	Not all means are equal
Significance level	α = 0,05

Equal variances were assumed for the analysis.

Factor Information

Factor	Levels	Values
Department	4	Call Centre. Clerical. Mail Room. Settlement

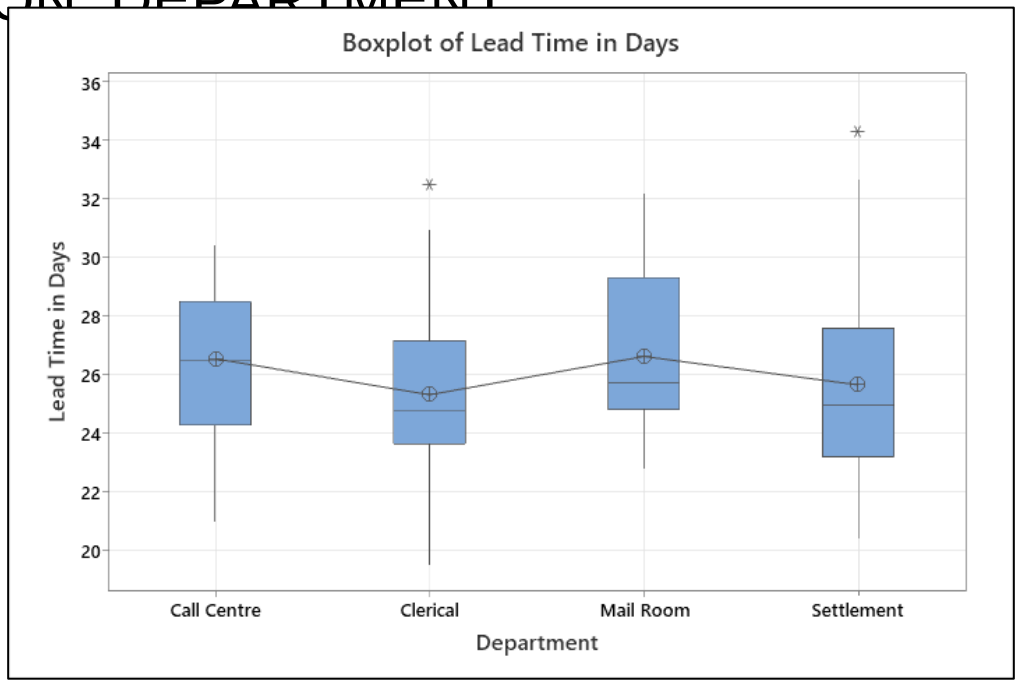
Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Department	3	33,96	11,320	1,33	0,268
Error	148	1262,02	8,527		
Total	151	1295,98			

Means

Department	N	Mean	StDev	95% CI
Call Centre	15	26,561	2,717	(25,071. 28,051)
Clerical	54	25,333	2,661	(24,548. 26,118)
Mail Room	18	26,641	2,871	(25,280. 28,001)
Settlement	65	25,670	3,170	(24,955. 26,386)

Pooled StDev = 2,92012



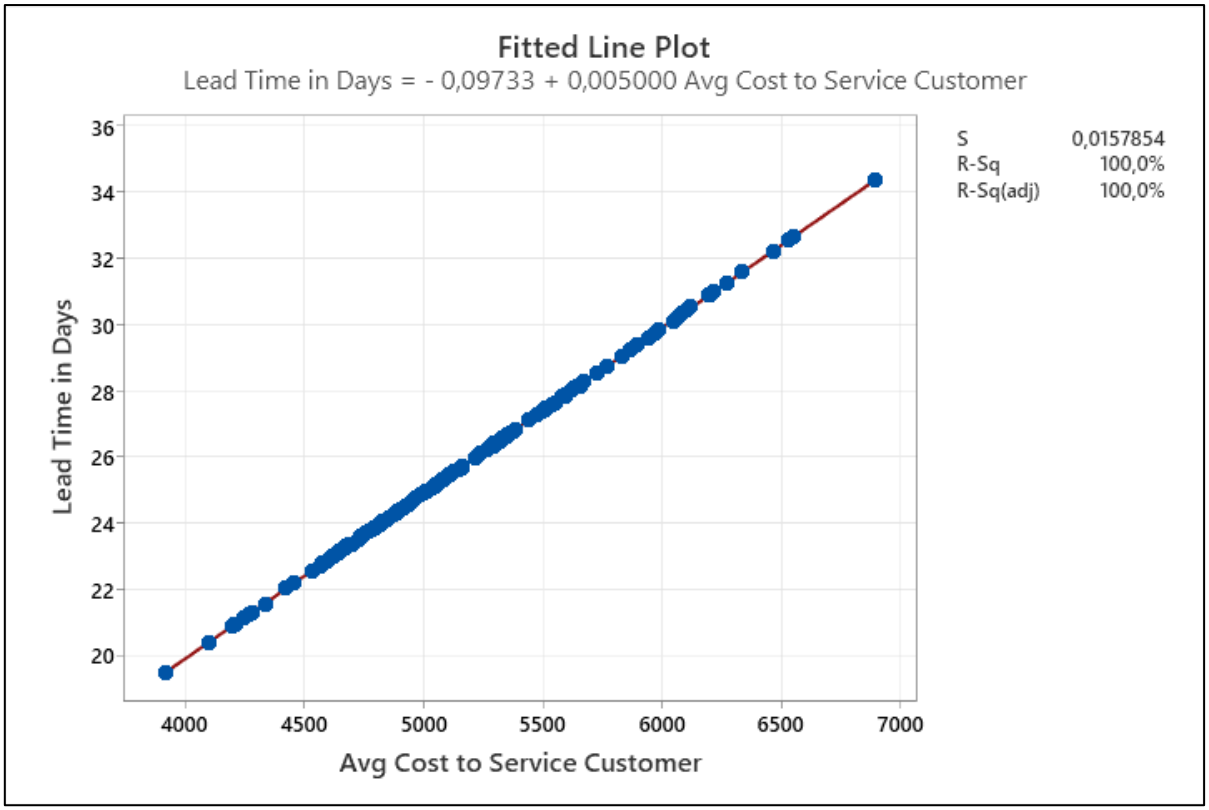
P-value = 0.268

Conclusion: Which a P-value greater than 0.05 at 95% confidence level, we cannot validate Department type as root cause there is no statistical evidence that department type significantly impacts lead time

Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
2,92012	2,62%	0,65%	0,00%

ROOT CAUSE VALIDATION: AVG COST TO SERVICE CUSTOMER



Model Summary

S	R-sq	R-sq(adj)
0,0157854	100,00%	100,00%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	1295,94	1295,94	5200824,89	0,000
Error	150	0,04	0,00		
Total	151	1295,98			

P-value = 0,0000

- The regression analysis shows a p-value of 0.000, indicating a significant correlation.
- **Conclusion:** Although there is a significant correlation between average cost and lead time, correlation does not imply causation. It is possible that increased lead times are driving higher costs rather than cost being a root cause. Further investigation is needed to confirm causation.

FURTHER STATISTICAL ANALYSIS: ACCURACY

Beyond determining the root causes of lead time issues, I also proceeded to determine the root causes for poor accuracy performance. The validated root causes are Operator, Product Type, and Lead Time, each significantly impacting the accuracy of claims processing. The First Time Resolution factor, however, did not show significant statistical evidence as a root cause for accuracy issues.

Likely Cause	Type of Input	Graphical Technique	Statistical Technique	Process Technique	Confirmed Root Causes
Operator	Discrete	Boxplot	ANOVA	5 Whys	
Product Type	Categorical	Boxplot	ANOVA	Process Mapping	
First Time Resolution	Categorical	Boxplot	T-test	-	
Lead Time	Continuous	Scatter Plot	Quadratic Regression	Process Re-design	

ROOT CAUSE 1-ACCURACY- STATISTICAL ANALYSIS

ROOT CAUSE VALIDATION: OPERATOR

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Operator	5	56,20	11,240	2,30	0,048
Error	146	712,75	4,882		
Total	151	768,95			

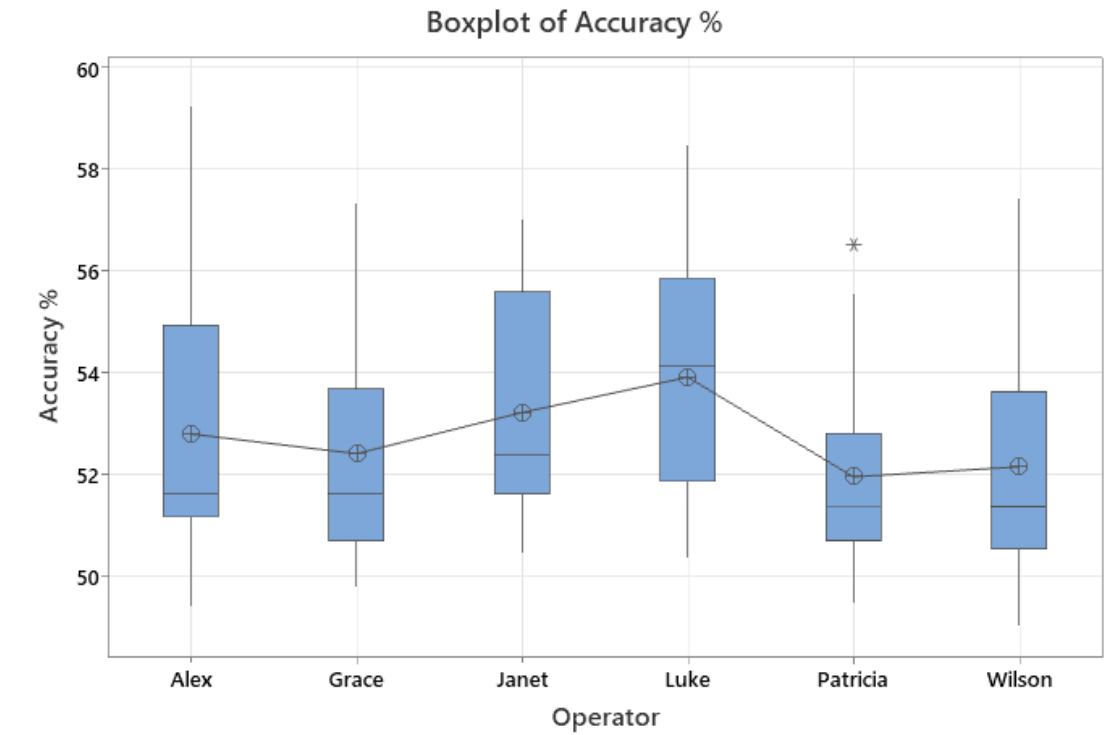
Factor Information

Factor	Levels	Values
Operator	6	Alex. Grace. Janet. Luke. Patricia. Wilson

Means

Operator	N	Mean	StDev	95% CI
Alex	36	52,795	2,463	(52,067. 53,522)
Grace	22	52,407	2,308	(51,476. 53,338)
Janet	16	53,215	2,171	(52,123. 54,306)
Luke	16	53,909	2,419	(52,817. 55,000)
Patricia	37	51,952	1,779	(51,234. 52,670)
Wilson	25	52,150	2,200	(51,276. 53,023)

Pooled StDev = 2,20949



Conclusion: Which a P-value less than 0.048 at 95% confidence level, we can validate type Operator as root cause for poor accuracy because there is statistical evidence that Operator significantly impacts Accuracy.

P-value = 0.048

ROOT CAUSE 2-ACCURACY- STATISTICAL ANALYSIS

ROOT CAUSE VALIDATION: PRODUCT TYPE

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Product Type	6	545,7	90,945	59,06	0,000
Error	145	223,3	1,540		
Total	151	768,9			

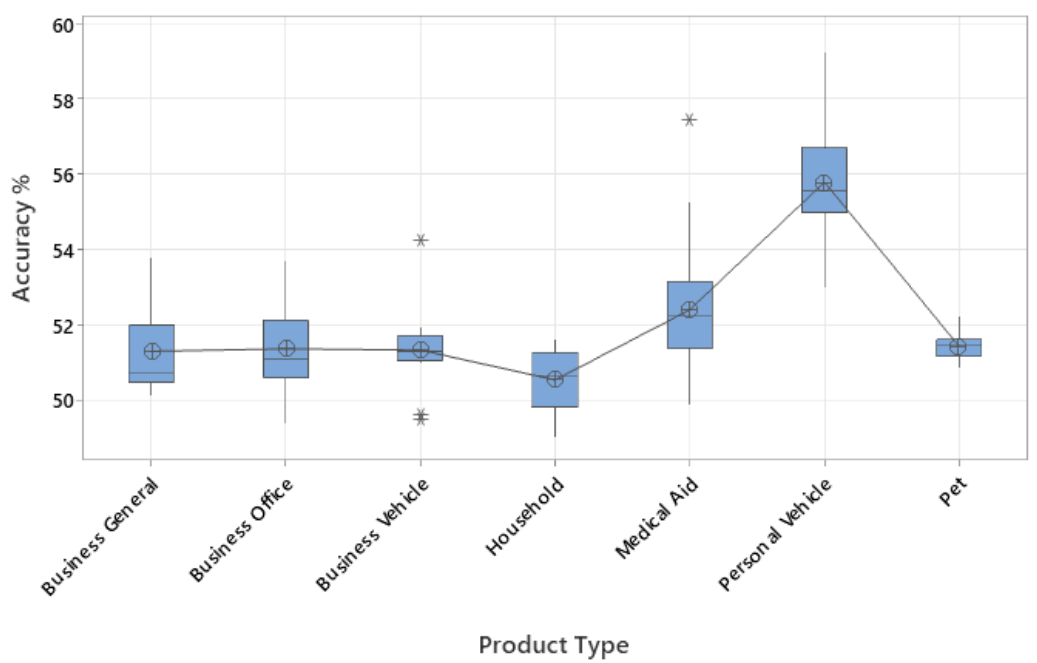
Means

Product Type	N	Mean	StDev	95% CI
Business General	18	51,292	1,104	(50,714. 51,870)
Business Office	18	51,357	1,071	(50,779. 51,935)
Business Vehicle	13	51,323	1,144	(50,643. 52,004)
Household	17	50,531	0,768	(49,936. 51,126)
Medical Aid	37	52,394	1,587	(51,991. 52,797)
Personal Vehicle	37	55,783	1,351	(55,380. 56,186)
Pet	12	51,420	0,376	(50,712. 52,128)

Pooled StDev = 1,24091

Factor Information

Factor	Levels	Values
Product Type	7	Business General. Business Office. Business Vehicle. Household. Medical Aid. Personal Vehicle. Pet



Conclusion: Which a P-value less than 0.000 at 95% confidence level, we can validate type product type as root cause for poor accuracy because there is statistical evidence that productive type significantly impacts Accuracy.

ROOT CAUSE 3-ACCURACY- STATISTICAL ANALYSIS

ROOT CAUSE VALIDATION: FIRST TIME RESOLUTION

Descriptive Statistics: Accuracy %

First Time Resolution	N	Mean	StDev	SE Mean
No	148	52,58	2,24	0,18
Yes	4	52,94	3,04	1,5

Estimation for Difference

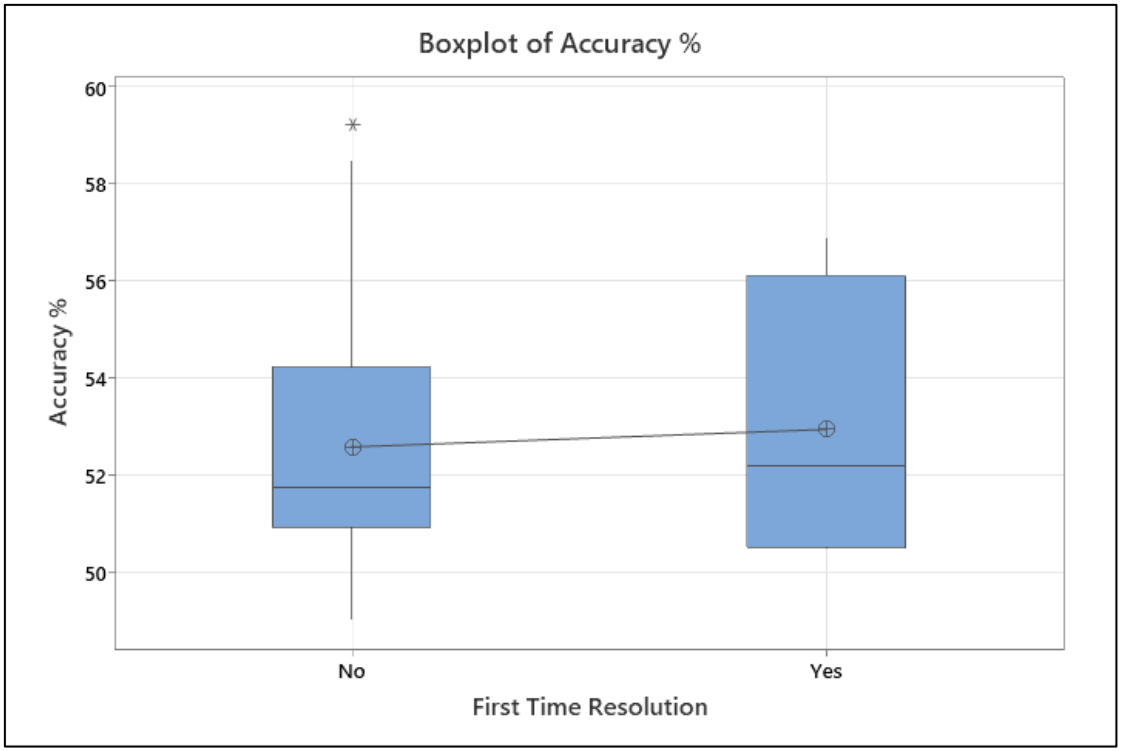
Difference	95% CI for Difference
-0,36	(-5,23. 4,51)

Test

Null hypothesis $H_0: \mu_1 - \mu_2 = 0$

Alternative hypothesis $H_1: \mu_1 - \mu_2 \neq 0$

T-Value	DF	P-Value
-0,24	3	0,828



Conclusion: Which a P-value less than 0.828 at 95% confidence level, we can validate first time resolution as root cause for poor accuracy because there is no statistical evidence that first time resolution significantly impacts Accuracy.

ROOT CAUSE 4-ACCURACY- STATISTICAL ANALYSIS

ROOT CAUSE VALIDATION: LEAD TIME

Model Summary

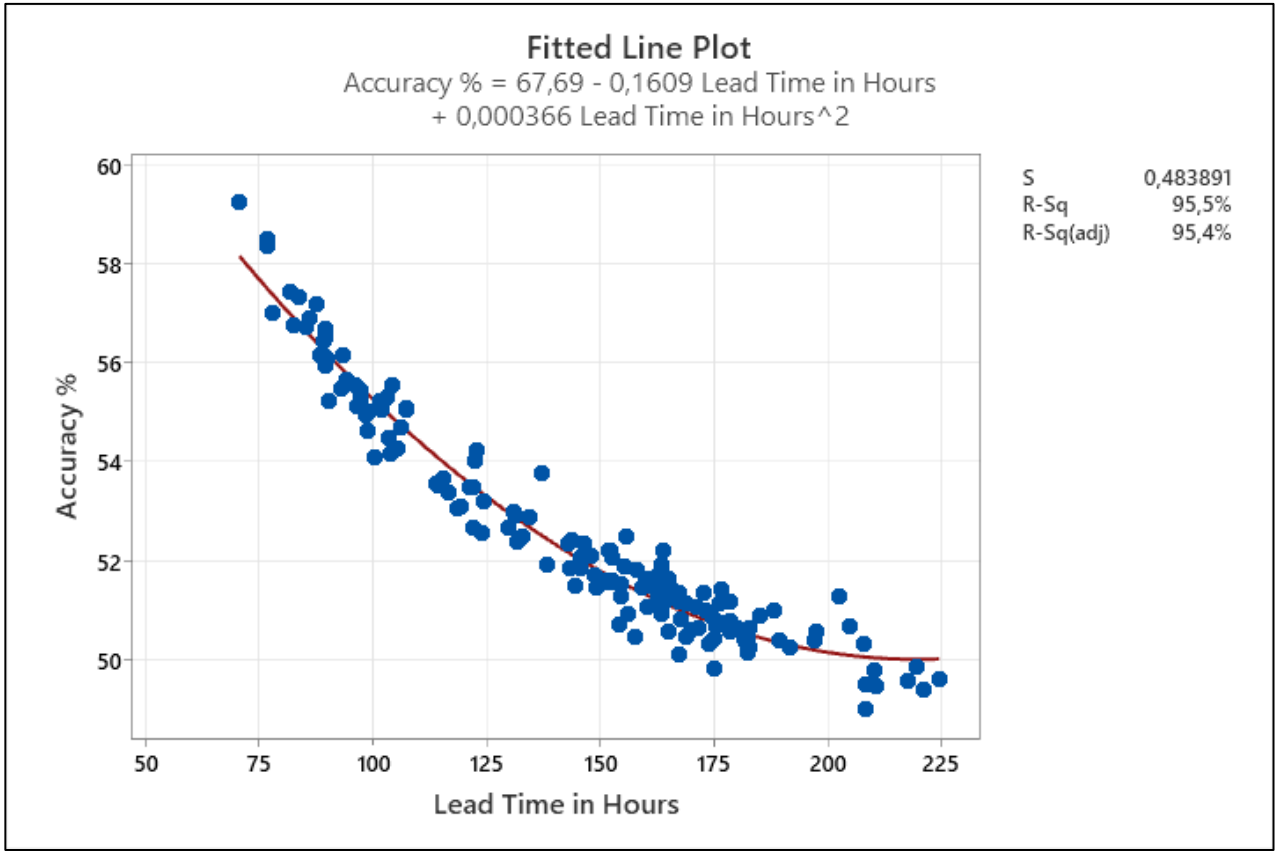
S	R-sq	R-sq(adj)
0,483891	95,46%	95,40%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	2	734,060	367,030	1567,50	0,000
Error	149	34,888	0,234		
Total	151	768,948			

Sequential Analysis of Variance

Source	DF	SS	F	P
Linear	1	689,928	1309,65	0,000
Quadratic	1	44,132	188,48	0,000



Conclusion: Which a P-value less than 0.000 at 95% confidence level, we can validate an increase in lead time results in a decrease in accuracy with an R-sq value of 95.46% Quadratic regression.

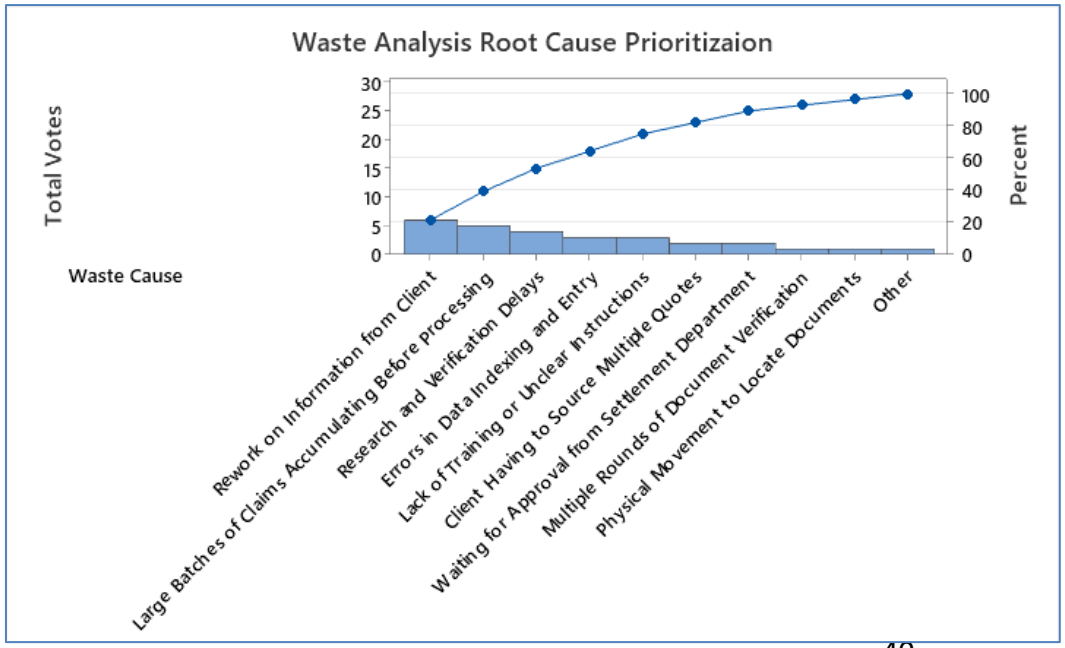
ANALYSE PROJECT REVIEW CHECKLIST

Type of Waste	Process Waste Identified
Transport	• Rework on info from client • Transporting documents to different areas for approval and verification.
Inventory	• Client having to source 3 quotes Large. • Batches of claims accumulating before processing in Settlement.
Motion	• Re-capturing info from client document. • Physical movement required to locate documents within departments.
Waiting	• Researching by Clerk and Claims • Supervisor Waiting for Settlement Department to call for a batch of claims.
Overproduction	• Requesting more than three vendor quotes for a claim. • Repeated requests for information from clients.
Over Processing	• Multiple rounds of rework due to inconsistent information or lack of guidelines. • Repeated document verification steps involving multiple stakeholders.
Defects	• Keeping and releasing documents causing delays. • Errors in indexing or entering data into the system.
Skills	• Another review by supervisor. • Lack of training or unclear instructions for document handling.

WASTE ANALYIS: CONTINUED

A multi-voting exercise was conducted with stakeholders to prioritize the most critical waste causes in the claims process, focusing efforts on addressing the highest impact issues effectively.

Waste Cause	John Smith	Jane Doe	Mark Johnson	Susan Clark	Bongienkosi Ndaba	Peter Adams	Total Votes
Rework on Information from Client	✓	✓	✓	✓	✓	✓	6
Client Having to Source Multiple Quotes	✓		✓				2
Transporting Documents for Approval and Verification				✓			1
Large Batches of Claims Accumulating Before Processing	✓		✓	✓	✓	✓	5
Physical Movement to Locate Documents			✓				1
Research and Verification Delays		✓		✓	✓	✓	4
Waiting for Approval from Settlement Department	✓					✓	2
Repeated Requests for Information from Clients							0
Multiple Rounds of Document Verification		✓					1
Errors in Data Indexing and Entry			✓	✓		✓	3
Lack of Training or Unclear Instructions				✓		✓	3



The Pareto analysis highlights the top five contributors to waste in the claims process: "Rework on Information from Client," "Large Batches of Claims Accumulating Before Processing," "Research and Verification Delays," "Errors in Data Indexing and Entry," and "Lack of Training or Unclear Instructions." Together, these factors account for approximately 72.2% of the total waste. Addressing these issues will yield the most significant improvements in process efficiency.

PROCESS ANALYSIS SUMMARY

Likely Cause	Type of Input	Graphical Technique	Statistical Technique	Process Technique	Confirmed Root Causes
Rework on Information from Client	Discrete	Pareto Chart	Brainstorming (Multivolting)	Process Mapping	
Large Batches of Claims Accumulating Before Processing	Continuous	Pareto Chart	Brainstorming (Multivolting)	Lean Process Improvement	
Research and Verification Delays	Continuous	Pareto Chart	Brainstorming (Multivolting)	Value Stream Mapping	
Errors in Data Indexing and Entry	Discrete	Pareto Chart	Brainstorming (Multivolting)	Error Proofing	
Lack of Training or Unclear Instructions	Discrete	Pareto Chart	Brainstorming (Multivolting)	Training & Development	
Client Having to Source Multiple Quotes	Discrete	Pareto Chart	Brainstorming (Multivolting)	Process Improvement	
Waiting for Approval from Settlement Department	Continuous	Pareto Chart	Brainstorming (Multivolting)	Lean Process Improvement	
Multiple Rounds of Document Verification	Discrete	Pareto Chart	Brainstorming (Multivolting)	Process Standardization	
Physical Movement to Locate Documents	Continuous	Pareto Chart	Brainstorming (Multivolting)	Workplace Organization (5S)	

ANALYSE PROJECT REVIEW CHECKLIST

Complete Analysing the Root Causes	Complete
Analyse planned?	**Yes** / No
Inputs systematically reviewed?	**Yes** / No
Graphical analysis done?	**Yes** / No
Graphical analysis confirmed with statistical analysis?	**Yes** / No
Process Analysed for inefficiencies?	**Yes** / No
Waste analysed?	**Yes** / No
Opportunities for 5S?	**Yes** / No
Root Causes Confirmed?	**Yes** / No

- Define
- Measure
- Analyse
- Improve
- Control

Improve

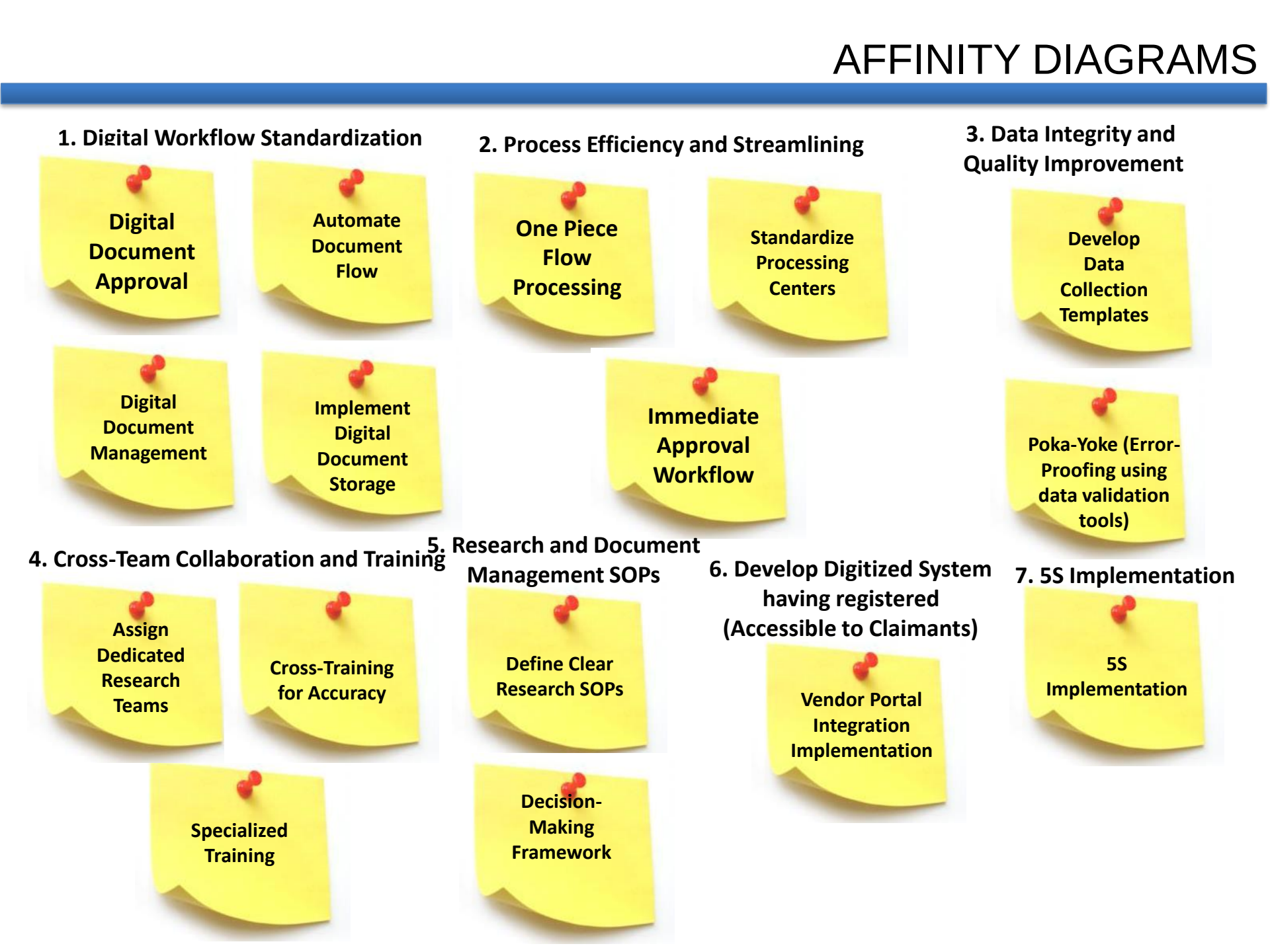
- Generate Solutions
- Select the Solution
- Risk Assessment
- Implementation Plan

LIST OF IMPROVEMENTS

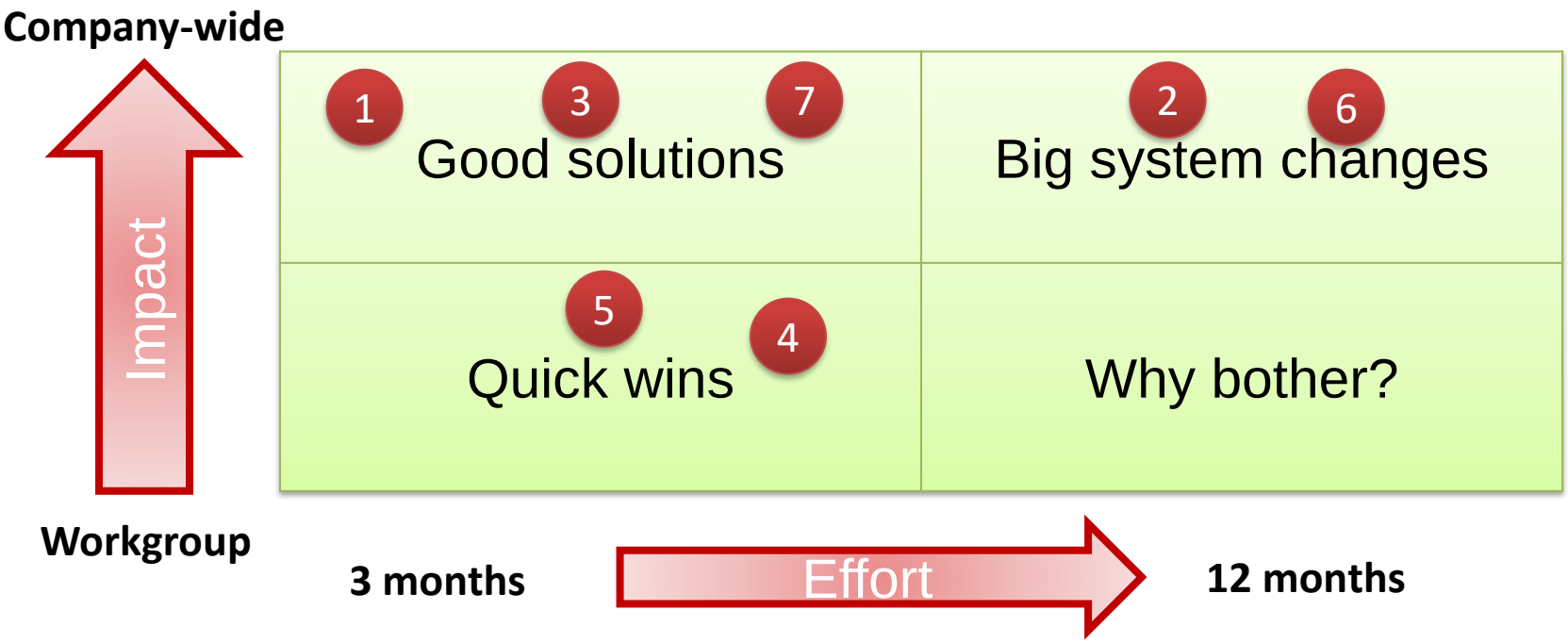
IMPROVEMENTS AND BENEFITS

Category	Validated Root Cause	Improvement Suggestion	Description	Potential Benefit
Lead Time	Large batches of claims accumulating before processing	One Piece Flow Processing	Implement batch size reduction techniques for more continuous processing	Reduced lead time and improved flow
	Transporting documents for approval and verification	Digital Document Approval	Implement electronic approval workflow	Reduced document transport time and manual handling
	Waiting for approval from Settlement Department	Immediate Approval Workflow	Set automated notification triggers for faster approval	Reduced waiting time and delays
	Keeping and releasing documents causing delays	Automate Document Flow	Use workflow software to automatically route documents	Reduced wait times and faster processing of claims
	Differences in Location	Standardize Processing Centers	Implement standardized procedures across all locations	Reduced variability in lead time and improved consistency
	Mailroom disorganized	5S Implementation	Sort, set in order, shine, standardize, and sustain the mailroom	Improved efficiency in document handling and reduced delays
Accuracy	Errors in data indexing and entry	Poka-Yoke (Error-Proofing)	Implement error-proofing with data validation tools that track real-time errors	Reduced manual errors and improved data accuracy
	Rework on information from client	Develop Data Collection Templates	Design structured data collection forms for clients	Minimized data entry errors and need for rework
	Differences in Product Type	Specialized Training	Conduct specific training based on different product types	Increased accuracy across diverse product types
	Unclear Research Guidelines	Define Clear Research SOPs	Establish clear, standardized operating procedures for research	Improved accuracy and reduced rework
Waste Analysis	Physical movement to locate documents	Implement Digital Document Storage	Digitize documents and implement a document management system	Reduced physical movement and delays
	Multiple rounds of document verification	Streamline Verification Process	Implement a single verification step with better training	Minimized rework and faster processing
	Client having to source 3 quotes	Vendor Portal Integration	Integrate a vendor portal allowing clients to directly compare quotes	Faster quote sourcing and reduced client burden
	Hardcopy documents cause delays	Digital Document Management	Transition from hardcopy to electronic document handling	Reduced physical movement and delays, improved accessibility
	Decision-points – no answers or guidelines	Decision-Making Framework	Establish guidelines for common decision points	Reduced confusion, faster decision-making process
	Researching by Clerk and Claims supervisor	Assign Dedicated Research Teams	Assign specific staff for research to streamline workflow	Faster research times and decreased workload duplication
	Accuracy affecting cycle time	Cross-Training for Accuracy	Cross-train team members on multiple tasks to enhance accuracy	Improved cycle time due to reduced

AFFINITY DIAGRAMS

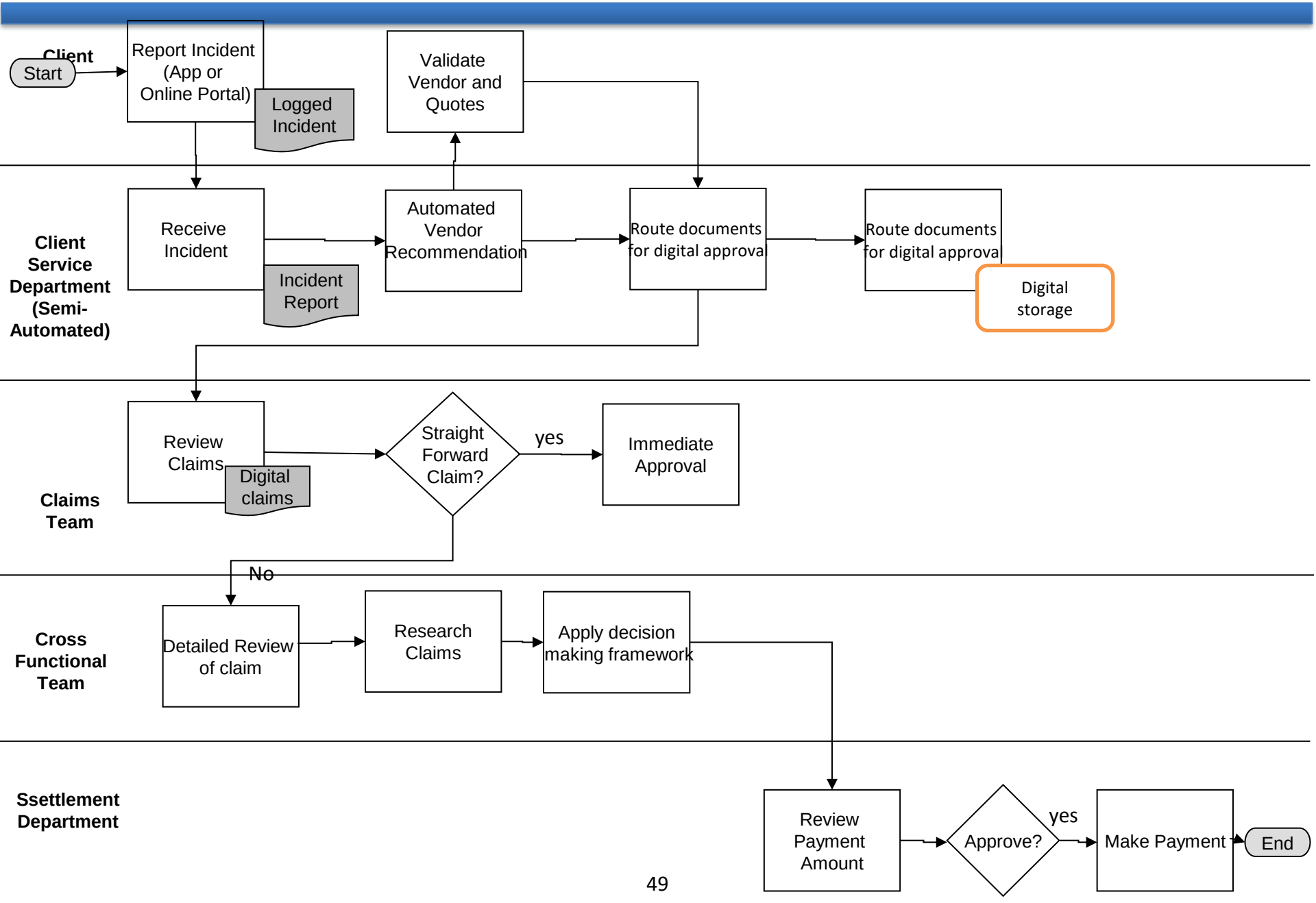


PAYOFF MATRIX



Solution Number	Category Placement	Reason for Placement
1. Digital Workflow Standardization	Good Solutions	Improves consistency across the company with a manageable implementation timeframe.
2. Process Efficiency and Streamlining	Big System Changes	Requires significant process changes but has a high impact across multiple departments.
3. Data Integrity and Quality Improvement	Good Solutions	Enhances data accuracy, with a substantial company-wide benefit and moderate implementation effort.
4. Cross-Team Collaboration and Training	Quick Wins	Can be implemented quickly to improve collaboration and team efficiency with immediate results.
5. Research and Document Management SOPs	Quick Wins	Establishes standards that can be rolled out quickly, improving document handling in the short term.
6. Develop Digitized System (Accessible to Claimants)	Big System Changes	Requires new infrastructure development and changes to existing processes, yielding high long-term impact.
7. 5S Implementation	Good Solutions	Improves organization and efficiency throughout the company with a relatively straightforward effort.

AS IS PROCESS MAP-DETAILED



FMEA – RISK ASSESSMENT

Item or Process Step	Potential Failure Mode	Potential Effect(s) of Failure	SEVERITY	Potential Cause(s)	OCCURRENCE	Current Controls	DETECTION	RPN	Recommended Action	Responsible
Report Incident (App or Online Portal)	Incorrect/Incomplete Details	Delays in Incident Logging	6	User error, lack of clarity	5	Instructional prompts	4	120	Implement mandatory form validation	Client Service Team
Validate Vendor and Quotes	Incorrect Vendor Details	Wrong Vendor Chosen, Delays	7	Incomplete data verification	4	Double-check quotes	5	140	Use vendor verification automation tool	Vendor Management Team
Receive Incident	Incident Lost During Transition	Delay in Processing	8	Manual data handling	3	Automated notification confirmation	4	96	Enable end-to-end incident tracking	Client Service Team
Automated Vendor Recommendation	Incorrect Vendor Suggestion	Inefficient Claim Processing	7	Incorrect algorithm configuration	3	Regular review of recommendation	4	84	Review and optimize algorithms regularly	System Maintenance Team
Route Documents for Digital Approval	Misroute or System Glitch	Delays in Approval Process	6	Routing rules not updated	4	Routing rule check	4	96	Periodically update routing rules	Automated System Team

FMEA – RISK ASSESSMENT CONTINUED

Item or Process Step	Potential Failure Mode	Potential Effect(s) of Failure	SEVERITY	Potential Cause(s)	OCCURRENCE	Current Controls	DETECTION	RPN	Recommended Action	Responsible
Review Claims	Claims Reviewed Incorrectly	Incorrect Approval/Denial	8	Human error	4	Two-step review by another analyst	5	160	Implement checklist for reviewers	Claims Team
Research Non-Straightforward Claims	Prolonged Review Time	Extended Processing Times	6	Overloaded team	5	Task prioritization	3	90	Cross-train additional support staff	Cross Functional Team
Apply Decision Making Framework	Incorrect Framework Application	Incorrect Outcome	7	Lack of training	3	Training sessions	4	84	Conduct refresher training	Cross Functional Team
Review Payment Amount	Payment Errors	Wrong Amount Disbursed	8	Incorrect data entry	3	Payment verification procedure	4	96	Introduce automated payment check system	Settlement Department
Make Payment	System Error During Payment	Payment Delays	7	Network or system glitches	2	System reliability monitoring	3	42	Add redundancy to payment system	IT Team

FMEA – RISK ASSESSMENT CONTINUED

Summary of High RPN Risks (FMEA)
High Risk Areas Identified:
1.Claims Review by Claims Team:

1. *Risk*: Errors during claim approval or denial (RPN: 160).
2. *Mitigation*: Implement checklists and two-step reviews.

2.Incident Reporting by Client:

1. *Risk*: Incomplete or incorrect incident details causing delays (RPN: 120).
2. *Mitigation*: Use mandatory form validation on the online portal.

3.Payment Review:

1. *Risk*: Incorrect payment amounts (RPN: 96).
2. *Mitigation*: Use an automated payment validation system.

Conclusion:
The **Claims Review** and **Incident Reporting** are the highest risk areas. Focused improvements like **automation** and **training** are key to reducing these risks and improving process reliability.

TRAINING PLAN

Process: Claims Process
Process Owner: Black Belt/Green Belt:

Item	Who Needs Training?	Training required	Training material:	Who will conduct training	Who will take ongoing responsibility?
1	Claims Team	Digital Claims Review Process	Process SOP, System Demo	Process Owner	Claims Team Lead
2	Cross-Functional Team	Exception Handling and Research Procedures	Process Framework, Research Tools	Black/Green Belt	Cross-Functional Team Lead
3	Automated System Team	System Configuration & Routing Automation	Software Guide, Automation Manual	IT Specialist	System Administrator
4	Settlement Department	Digital Payment Review and Approval Process	Payment SOP, System Guide	Finance Team Lead	Settlement Manager
5	Research Team	Complex Claims Analysis	Analysis Techniques Manual	Senior Analyst	Research Team Lead
6	Client Services Team	Incident Logging via Digital Portal	Incident Reporting Guidelines	IT Trainer	Client Services Supervisor
7	Supervisor	Decision-Making Framework Application	Framework Documentation	Black/Green Belt	Supervisor
8	Payment Team	Payment Processing and Digital Updates	Payment Software User Manual	Finance Team Lead	Payment Team Lead
1	Claims Team	Digital Claims Review Process	Process SOP, System Demo	Process Owner	Claims Team Lead

Handover date:

Process Owner: _____

Black/Green Belt: _____

IMPROVE PROJECT REVIEW CHECKLIST

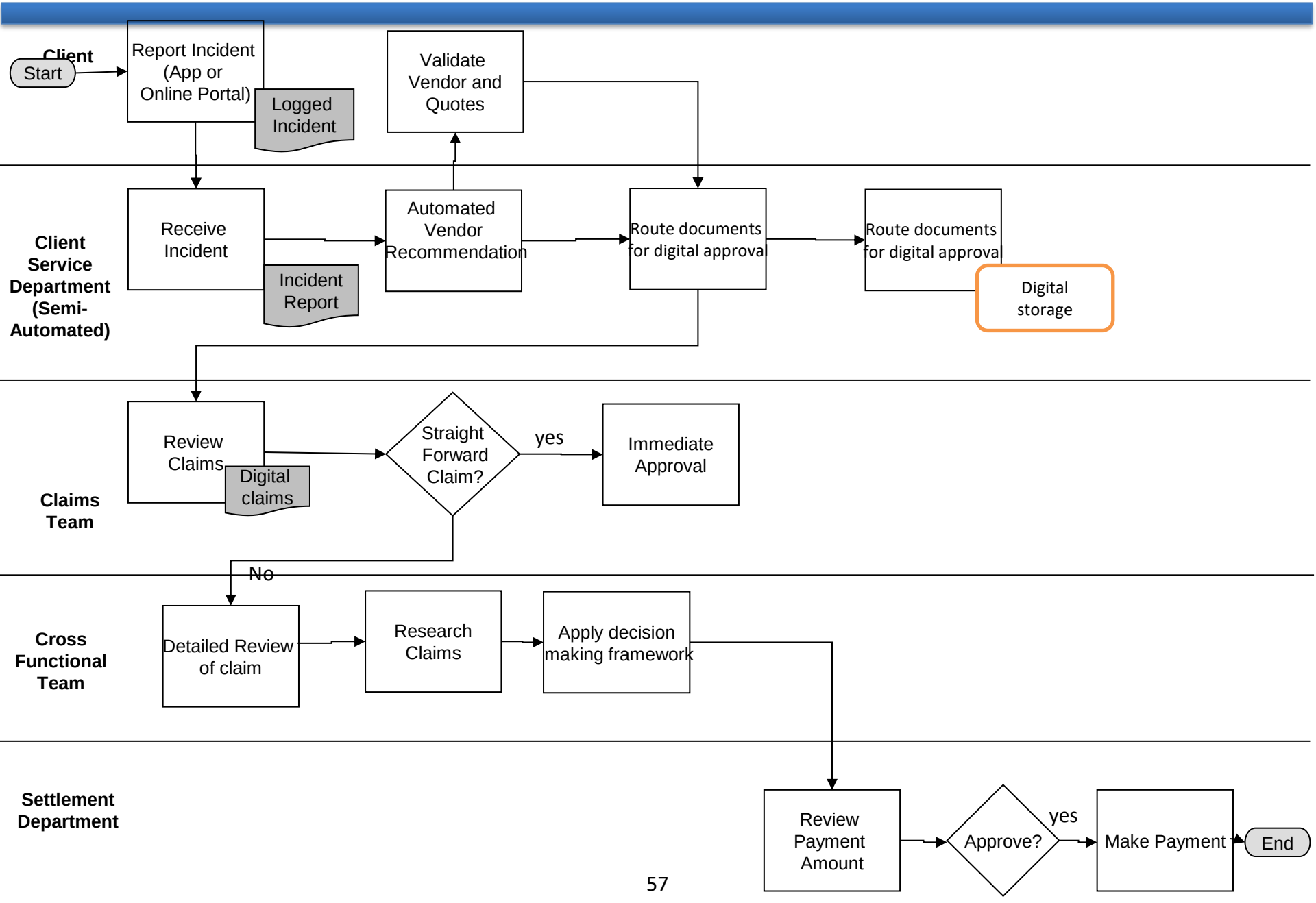
Complete Defining the Problem	Complete
List of improvement opportunities consolidated?	**Yes** / No
Solutions generated?	**Yes** / No
Solutions prioritised?	**Yes** / No
TO BE map agreed?	**Yes** / No
Risk assessment on new process conducted?	**Yes** / No
Mitigation actions incorporated into implementation plan?	**Yes** / No
Detailed implementation plan drawn up?	**Yes** / No
Training, documents and communication plans updated?	**Yes** / No
Improvements implemented and plan completed?	**Yes** / No
Financial benefits updated with implementation costs?	**Yes** / No
Critical Xs to control identified?	**Yes** / No

- Define
- Measure
- Analyse
- Improve
- Control

Control

- Control Charts
- Control Plan
- Validate the Solution
- Validate the Financial Benefits
- Handover to Process Owner

AS IS PROCESS MAP-DETAILED



PROCESS CONTROL DOCUMENT

Process Control Document

Process Description	Process Customer	Customer Requirements	Quality Indicators

Process Flow chart						Process Quality Indicators		Checking				Misc. info
Step	Time	Client Service Department (Semi-Automated	Claims Team	Cross Functional Team	Settlement Department	Process Indicator	Spec limits	What to check	When to check	Who to check	Action required for exception	
1	15 min	Receive Incident				Incident Report Received	100% Complete	Ensure full report content is received	Upon Receipt	Client Service Team	Follow up with Client for missing info	N/A
2	30 min	Automated Vendor Recommendation				Vendor Recommendation Accuracy	≥ 95%	Check vendor match	Continuous	Automated System	Alert IT for any mismatch	Automated
3	10 min	Route documents for digital approval				Routing Time	≤ 1 Hour	Verify routing time	Continuous	Automated System	Escalate to IT for delays	N/A
4	20 min	Route documents for digital approval				Digital Storage Time	≤ 1 Hour	Verify digital storage completion	Continuous	Automated System	Alert IT for issues	N/A
5	2 hours		Review Claims			Approval Completion	≤ 2 Hours	Verify claims review completion	Upon Claim Submission	Claims Team	Escalate for supervisor review	N/A

Approved: Date:

PROCESS CONTROL DOCUMENT CONTINUED

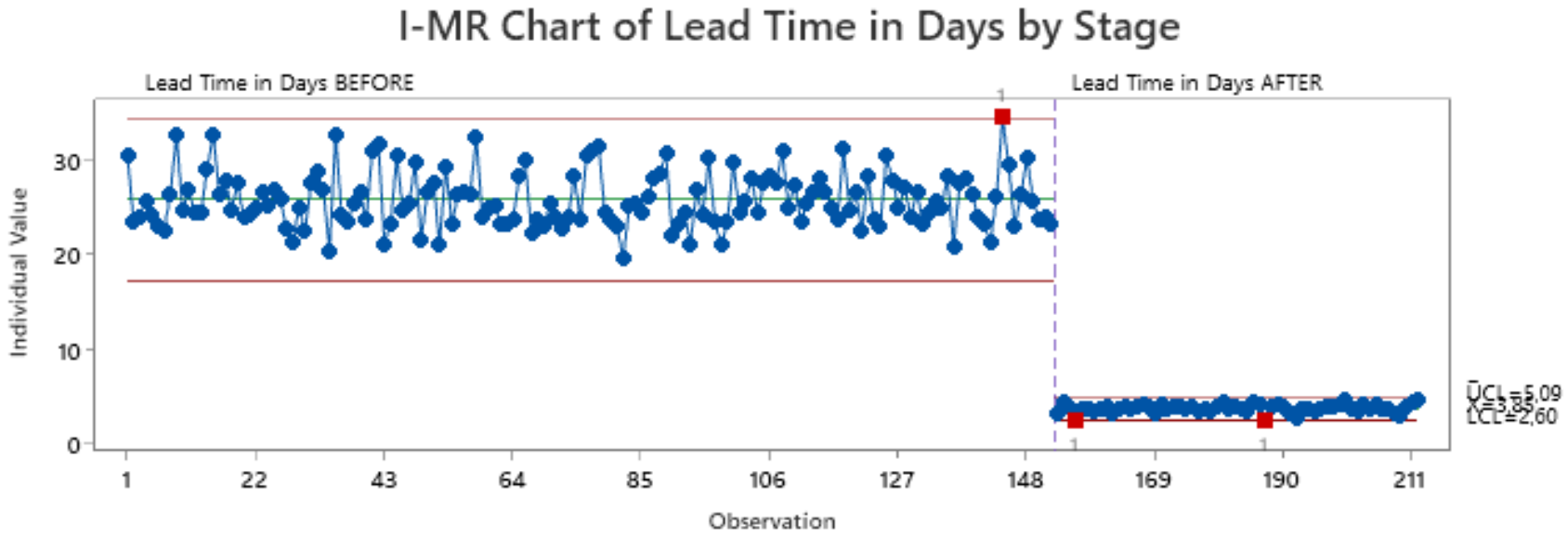
Process Control Document

Process Description	Process Customer	Customer Requirements	Quality Indicators

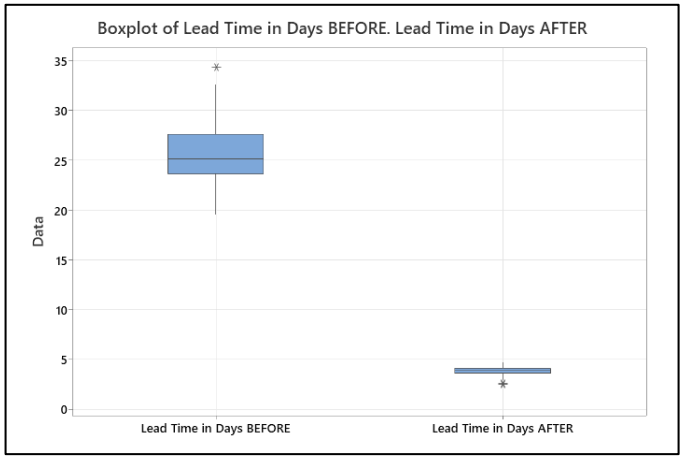
Process Flow chart						Process Quality Indicators		Checking				Misc. info
Step	Time	Client Service Department (Semi-Automated	Claims Team	Cross Functional Team	Settlement Department	Process Indicator	Spec limits	What to check	When to check	Who to check	Action required for exception	
6	1 hour		Immediate Approval			Immediate Approval Status	100% Complete	Verify claim approval	Continuous	Claims Lead	Escalate if delayed	N/A
7	3 hours			Research Claims		Detailed Review Completed	≥ 95% Accuracy	Verify review details	As Needed	Cross Functional Al Team	Reassign to Cross Functional Team	N/A
8	45 min			Apply decision making framework		Decision Completeness	100% Complete	Verify decision status	Continuous	Supervisor	Escalate for non-compliance	N/A
9	1 hour				Review Payment Amount	Payment Verification Time	≤ 24 Hours	Verify payment status	Daily	Settlement Team Lead	Escalate to Finance for delays	Confidential
105	30 min				Make Payment	Payment Process Duration	≤ 30 min	Confirm payment has been made	Upon Completion	Settlement Team Lead	Re-initiate payment process if failed	Confidential

Approved: Date:

PROCESS IMPROVEMENT CONFIRMATION: STABIBILITY

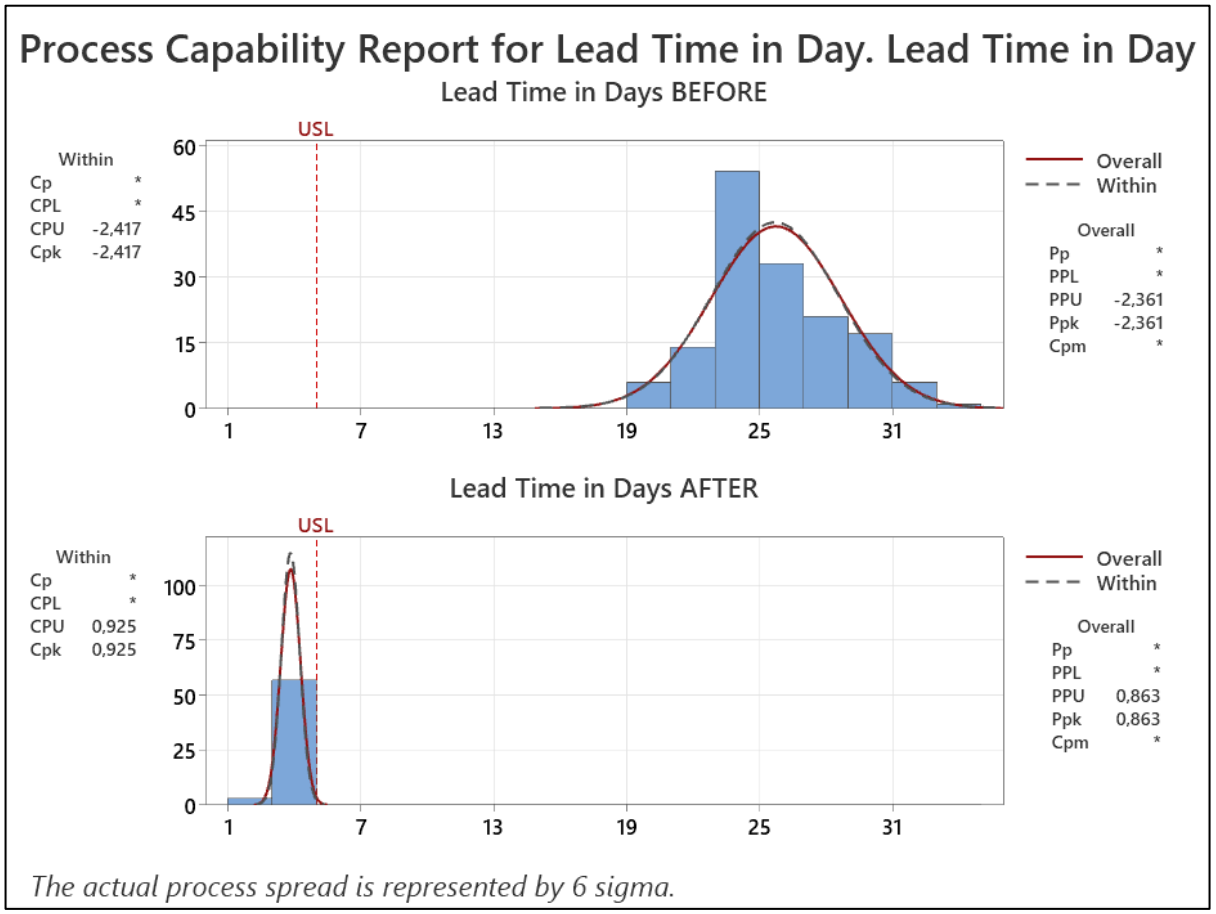


PROCESS IMPROVEMENT CONFIRMATION: CAPABIBILITY



Exp. Overall Performance

Variable	PPM < LSL	PPM > USL	PPM Total
Lead Time in Days BEFORE	*	1000000,00	1000000,00
Lead Time in Days AFTER	*	4795,22	4795,22



The process improvement has shown a significant reduction in lead time, as evident from both the boxplot and process capability charts. Lead time has dramatically decreased from an average of around 25 days to less than 5 days. This improvement reflects enhanced efficiency in our workflow, moving from a poorly performing state (Cpk = -2.417) to a capable process (Cpk = 0.925). The successful reduction of lead time confirms the effectiveness of implemented measures, positioning the process well within acceptable limits and boosting overall customer satisfaction and operational performance.

CONTROL PROJECT REVIEW CHECKLIST

Complete Defining the Problem	Complete
Customer Experience re-evaluated?	**Yes** / No
Control measures in place?	**Yes** / No
Control charts implemented?	**Yes** / No
Process Control Documented completed?	**Yes** / No
Results validated graphically and statistically?	**Yes** / No
Handover signed off?	**Yes** / No
Financial benefits tracked?	**Yes** / No
Celebrated success?	**Yes** / No

CELEBRATE SUCCESS!